3. They will be in-place and maintained during all operation and reclamation activities; and

4. They will be retained and maintained until after the release of all bonds.

For the purposes of the operation and reclamation activities, perimeter markers will be used in compliance with the following rules and regulations:

1. The perimeter of all areas affected by surface operations or facilities before beginning reclamation activities will be clearly marked; and

2. The perimeter of the SCA Permit Area will be clearly marked before the beginning of surface reclamation activities.

For the purposes of the operation and reclamation activities, buffer zone markers will be used in compliance with the following rules and regulations:

1. Signs will be erected to mark buffer zones as required under R645-301-731.600 and will be clearly marked to prevent disturbance by surface operations and facilities; and

2. Buffer zones will be marked along their boundaries as required under R645-301-731.600.

Topsoil markers have been erected to mark where topsoil or other vegetation-supporting material is physically segregated and stockpiled as required under R645-301-234.

522 COAL RECOVERY

SCA's activities will maximize the use and conservation of the coal resource by gleaning the very least amount of heating value originally extracted from the coal measures. SCA will utilize the best technology currently available to incinerate coal mine waste in a fluidized bed combustion boiler, which will supply steam to generate over 50 MW of electrical energy. Fluidized-bed combustion has been approved as the best technology to maintain environmental integrity during this waste utilization activity.

Abandoned coal refuse piles are often times reactivated, and reprocessed to recover a marketable coal product. On some occasions, piles are reworked several times, using various processing approaches. SCA's activities will assure that no reworking of this pile occurs in the future, as the small amount of remaining materials will have been determined to be non-combustible. SCA's use of coal mine waste to generate electricity is consistent with our national energy policy to conserve our domestic energy resources.

523 MINING METHODS

SCA's activities will include excavation and handling of coal mine waste and redisposal of non-combustible materials within the SCA Permit Area. Approximately 410,000 tons per year of coal mine waste will be consumed by SCA. The fueling plan for the coal waste fired generator will require excavation of accumulated waste from the existing pile areas, beginning as early as January 1993, and continuing for approximately thirty years. Based on SCA's contract for the sale of electricity to Utah Power and Light, handling coal mine waste to serve as an alternative energy fuel will be a consistent and continuous process. Coal mine waste that continues

to be generated by SCC's preparation plant will also be factored into SCA's fueling strategy, which can allow direct acceptance of waste at the facility, or temporary placement within the refuse disposal area prior to utilization.

Detailed plans on excavation activities can be found in Chapter Nine, Section 9.6.

SCA will use a standard mobile fleet of excavation equipment which may include all or some of the following: dozers, front-end loaders, end-dump trucks, scrapers, back-hoes, and support equipment (water truck, maintenance vehicles). Excavation will be carried out in lifts, to assure continued stability of the refuse pile, while providing ability to segregate non-combustible materials as they are encountered. An advancing benched face working area will provide access to fuel along a face on each working layer. Sampling and testing will be a continuous process to insure that materials provided to SCA's cogeneration facility meet minimum levels of combustibility. Materials will be segregated as they are excavated for handling in one of three ways: 1) direct hauling to the power plant site, 2) redisposal within the SCA noncombustible waste site, or 3) handled through a static grizzly on the refuse pile to separate non-combustibles (rocks, metal, timbers, etc.). Any materials separated through the grizzly will be temporarily stored in piles until loaded and transported to the combustor or the refuse disposal area. The grizzly staging area will be relocated from time to time as excavation activities warrant, and will minimize accumulations of separated materials.

523.100 thru 523.220 Surface Coal Mining and Reclamation Operations Relating to Underground Mines

No activities related to the SCA Permit Area will be conducted closer than 500 feet of an underground or abandoned underground mine. This is reinforced by the fact that there are no underground or abandoned underground mines within 500 feet of the SCA Permit Area boundary.

524 BLASTING AND EXPLOSIVES

There will be no blasting or explosives used within the SCA Permit Area. Thus, regulations 524 through 524.800 are not applicable to this Permit Application and consequently are not addressed.

525 SUBSIDENCE

No material damage or diminution within the Permit Area will be caused by subsidence because no underground coal resources are available within the Permit Area which would cause subsidence. No past or future underground coal mining operations have or are likely to occur within the SCA Permit Area.

526 MINE FACILITIES

The following sections contain narratives explaining the construction, modification, use and maintenance of facilities that lie within the SCA Permit Area and are designated in sections 526.100 through 526.300.

526.100 thru 526.116 Mine Structures and Facilities

Surface and subsurface facilities and features which existed prior to January 21, 1981 are shown on Plate 5-8 existing surface and subsurface facilities and features. Existing surface features are identified on Plate 5-1

Surface Facilities, and Plate 4-5 Cogeneration Facility.

SLURRY HANDLING and STORAGE

The **slurry ditch** was constructed in the 1950's, for the purpose of transporting coal processing waste in slurry form from the Sunnyside Mine wash plant to the disposal sites within the current SCA permit area. Surface drainage from the hillside north and east of the SCA permit area as well as the area between the railroad tracks is collected by the coal slurry ditch and can be routed with the coal fines through either Slurry Pond 1 or Slurry Pond 2 and then into the Clear Water Pond (see Plate 7-5).

Typically, during operation of the Sunnyside coal wash plant, one slurry pond is in use while the other is in either the drying or cleaning stages. Occasionally when both slurry ponds are being serviced, flows are diverted to the East Slurry Cell The ditch meets or exceeds the permanent program performance standards. It is of sufficient size to safely pass the design storm as calculated in Appendix 7-3.

The **West Slurry Cell** (MSHA No. 1211-UT-09-01813-01) is located near the center of the permit area. The cell was constructed in the 1950's as a disposal site for fine coal refuse slurry. Wet slurry was last deposited in this cell in 1975 when the East Slurry Cell was put in operation. Since then, dry coal fines from other slurry cells as well as coarse refuse from the Sunnyside Mine have been placed in the cell. This area is scheduled to be actively mined by SCA during the first years of operations. Regular monitoring is conducted in accordance with the regulations for this structure. These monitoring reports are available at the mine site. See Appendix 7-3 for hydrologic calculations.

A dike was constructed of non-combustible earth materials across the existing wash to impound the slurry. This dike was subsequently covered with coarse refuse material to stabilize the west bank of the slurry cell in order to meet the permanent program performance standards under SMCRA. This dike material will be excavated during the SCA operations.

The **East Slurry Cell** is located adjacent to and on the east side of the West Slurry Cell. The cell was constructed in 1974 primarily of coarse refuse material. The pond was constructed with a total capacity of 184 acre-feet. The East Slurry Cell is a temporary control structure with MSHA No. 1211-UT-09-01813-01. The structure is a temporary impoundment as addressed in R645-301-733. The structure is addressed by the MSHA criteria of 30 CFR 77.216(a). Storm runoff captured by the impoundment is allowed to evaporate or infiltrate. The SCA operations attempt to minimize the surface area from which precipitation runoff is allowed to flow into the East Slurry Cell.

The outer slopes of the east bank of the East Slurry Cell were reclaimed by the Sunnyside Coal Mine. SCA intends to excavate the suitable coarse refuse and the fine refuse from the cell in accordance with the mining plan outlined in Chapter nine. Regular monitoring is conducted in accordance with the regulations for this structure. These monitoring reports are available at the mine site. See Appendix 7-3 for hydrologic calculations. This cell meets or exceeds the permanent program performance standards.

Slurry Ponds #1 and #2 are located near the northeast corner of the permit area. They were constructed during the 1970's to de-water the slurry from the Sunnyside coal wash plant. Fine refuse slurry material can arrive from the coal preparation wash plant by way of the open slurry ditch. The ponds are designed to be used for de-watering, settling and filtration of the coal fines.

During typical, operations of the Sunnyside Coal Company's coal wash plant, one slurry pond is in use while the

other is in either the drying or cleaning stages. Occasionally when both slurry ponds are being serviced, flows can be diverted to the East Slurry Cell and runoff does not go into the Clear Water Pond. Routine flow of the coal fines is manually controlled by the Sunnyside Coal Mine. The coal fines and sediment are allowed to fill to a maximum level that allows sufficient remaining volume in the pond to contain the design storm runoff.

The ponds are partitioned with a filter dike. The filter dike for Slurry Pond 2 was retro-fitted in 1993 with a filtering fabric to reduce the migration of coal fines into the Clear Water Pond. The water filters through to an eight inch outlet pipe that routes it to the Clear Water Pond for further settling. The eight-inch pipe is the only outlet from the Slurry Ponds. The Slurry Pond is the primary sediment structure with the Clear Water Pond providing final treatment prior to discharge to the Icelander drainage. At no time will the slurry pond discharge directly to the Icelander Drainage.

These two slurry ponds are temporary impoundments as addressed in R645-301-733. They are not addressed by the MSHA criteria of 30 CFR 77.216(a). They meet the single channel spillway exemption of R645-301-743-132 by meeting the requirements of R645-301-742.225.2. **Slurry Pond #1** has a total record volume of 16.4 acre-feet (top of bank). **Slurry Pond #2** has a total record volume of 15.3 acre-feet (top of bank). Regular monitoring is conducted in accordance with the regulations for these structures. These monitoring reports are available at the mine site. See Appendix 7-3 for hydrologic calculations. These ponds meet or exceed the permanent program performance standards.

The **Clear Water Sediment Pond** (UPDES 004), constructed during the 1970's and located near the northeast corner of the permit area, is an off channel, temporary sediment control structure, with a total record volume of 4.86 acre-feet (top of bank). It can be used as a water storage pond and final sediment treatment pond for the coal slurry water. The structure is a temporary pond as addressed in R645-301-732.200. The structure does not meet the size or other qualifying criteria of the MSHA of 30 CFR 77.216(a). Therefore, it provides a combination of principal and emergency spillways that will safely discharge a 25 year, 6 hour event.

The primary discharge is through a perforated eight-inch stand pipe. An emergency open channel spillway at elevation 6530.08 can safely discharge the 25 year 6 hour storm. Two open channel inlets (riprap lined) enter the pond. Also an eight inch pipe coming from the slurry ponds can contribute to the inflow. Most storm runoff from the watershed is routed through the slurry ponds and the main peak flows are not realized in the Clear Water Pond (see Plate 7-4).

Additional information concerning impoundments and slurry cells is available in Appendix 7-3. Other impoundments within the SCA permit site are also discussed in Section 526.300 Water Pollution Control Facilities as well as in Chapter 7 and Appendix 7-3. Regular monitoring of all impoundments is conducted in accordance with R645-514. These monitoring reports are available at the mine site and are submitted to the Division as required. All impoundments meet or exceed the permanent program performance standards.

COARSE REFUSE HANDLING and STORAGE

Construction of the **REFUSE PILE (MSHA ID Number 1211-UT-09-01813-02)**, which SCA is excavating, began prior to 1969. The western toe of the pile was extended to the west in the 1970's to provide a stable embankment for the West Slurry Cell and meet the permanent program performance standards. Additional refuse material was added to the top surface of the refuse pile by the Sunnyside Coal Mine as recently as 1994.

Plates 9-4 identify the location and extent of the coarse and fine refuse that has been deposited by the Sunnyside Coal Mine over the past decades and outlines the intended mining sequencing as SCA excavates the refuse usable

as fuel for the adjacent power plant. The information used to create these mine sequencing plates comes from a study conducted by John T. Boyd Inc. and has been included in Appendix 9-1 of the permit as a reference.

Temporary storage areas are identified on Plate 9-2. These areas were approved by DOGM in 1993. They are adequately graded to provide surface drainage towards an approved diversion which flows to an approved sediment pond. These areas meet or exceed the permanent program performance standards.

Refuse Haul Roads are appropriately identified and classified on plates 5-2. They are graded and maintained to meet or exceed the permanent program performance standards. Transportation facilities are further discussed in Section 527. The south portion of the Old Coarse Refuse Haul Road, constructed by Sunnyside Mine in the 1970's, was reclaimed by SCA in 1994 (see Plates 10-2).

The **Crushing and Conveyance Structures** located at the north end of the permit area were constructed in 1992. The permit boundary was increased in 1994 to include these facilities. Plate 4-5 identifies the structures within the permit area as well as the adjacent cogeneration facility. A narrative description of the facilities is in Chapter Four. These facilities are maintained and operated to comply with the appropriate MSHA requirements and to meet or exceed the permanent program performance standards.

The **Excess Spoil Pile** is currently under construction and will continue to be constructed throughout the life of the cogeneration facility. This area west of the West Slurry Cell was identified in 1993, for permanent disposal of excess spoil and coal mine waste. The permanent disposal will be constructed and maintained to meet the permanent program performance standards. Regular inspections will be conducted in accordance with R645-514.

Foundation studies conducted have determined that the area is appropriate for this permanent disposal facility within the constraints of its design. Surface water is diverted around the disposal area. This site is not a slurry cell and large quantities of wet waste are not disposed of in the pile. No existing seeps or water sources were identified, therefore, concerns about acid leachate were determined negligible. Under-drains were determined to be unnecessary. See Plates 9-1, Chapter nine, and Appendices 9-2, and 9-5 for design criteria.

The temporary storage area west of the Pasture pond for **Non-Coal Waste** was identified in 1993. This area will be used as described in Chapter Nine for the temporary storage of non-coal waste until such time as the material can be disposed in an appropriate local landfill. The storage area will be maintained in accordance with the permanent program performance standards. The **Industrial Waste Dump**, utilized by the Sunnyside Mine since the 1970's, was closed and capped with 18 inches of clay material as described in Chapter nine. This former dump site is now used by SCA as Temporary Storage Area #2.

Topsoil was removed prior to all new surface disturbance and construction which commenced following enactment of laws requiring its protection. The topsoil is stored in stockpiles on the permit site. After the useful life of these area from which the topsoil was removed, the topsoil will be used to reclaim the area in accordance with the reclamation plan. All topsoil piles on the SCA permit area are appropriately identified and protected. They have been revegetated for interim soil protection, and adequate berms are in place to contain eroded sediment from the piles as calculated in Appendix 7-7. They meet the permanent program performance standards. See plates 5-5 for cross-sections and volumes of the stockpiles.

The **Revegetation Test Plots** (formerly Sacco Flats Test Plots), located in the north-east portion of the permit site, were constructed by the Sunnyside Mine in the Fall of 1985. The SCA permit boundary was enlarged in 1993 to include the entire plots. These test plots are maintained to meet the permanent program performance

standards. Annual maintenance includes items such as fence repair and other items identified as necessary.

526.200 thru 526.222 Utility Installation and Support Facilities

The only utilities within the SCA Permit Area are power lines which are shown in Plate 5-1. These power lines are maintained by Utah Power and Light. All operations will be conducted in a manner which minimizes damage, destruction, or disruption of services provided by these UP&L electric lines.

Support facilities, of which there are currently none on-site, will be operated in accordance with a permit issued to SCA for the refuse disposal area. Plans and drawings for each support facility to be constructed, used, or maintained within the SCA Permit Area include a map, appropriate cross sections, design drawings, and specifications sufficient to demonstrate how each facility will comply with applicable performance standards. In addition to the other provisions of R645-301, support facilities will be located, maintained, and used in a manner that:

1. Prevents or controls erosion and siltation, water pollution, and damage to public or private property; and

2. To the extent possible using the best technology currently available - minimizes damage to fish, wildlife, and related environmental values; and minimizes additional contributions of suspended solids to stream flow or runoff outside the SCA Permit Area.

526.300 Water Pollution Control Facilities

The water pollution control facilities within the SCA Permit Area include sediment ponds and diversion ditches.

Sedimentation control ponds are used to store and/or treat water runoff from disturbed areas up to and including a 10-year, 24-hour event Designs of the ponds and diversions are located in Appendix 7-3. Details (including design drawings and calculations) for all sediment control ponds and diversion ditches are included in Chapter Seven, Section 720.

All sediment ponds will be inspected as outlined for impoundments in Section 514.

Sediment removed from the ponds will be disposed of in the excess spoil area. If the material is to be used as a borrow material, the material will first be sampled and tested to verify its quality. The operator will contact DOGM to receive approval of the location and the amount of material to be used. All impoundments meet or exceed the permanent program performance standards.

526.400 Air Pollution Control Facilities

SCA will continue its programs in the permit area to comply with the requirements of the Clean Air Act and other applicable air quality laws and regulations, as well as health and safety standards. A copy of the SCA Air Quality permit is included in Appendix 4-2.

Most of the region around the SCA Permit Area has been designated a Class II area for purposes of determining any significant amounts of air quality deterioration. Deterioration of the air quality is not expected during the permit period with the exception of short high wind periods when sand and smaller grained particles are picked up outside of the SCA Permit Area and added to the air in the permit area.

The haul roads used by the refuse trucks are unpaved. To control fugitive dust, roads around the main complex which are being used by mobile equipment will be treated with calcium chloride, potassium chloride, or other acceptable biodegradable, organic wetting agents or sprayed with water as required during dry periods as required by SCA's Air Quality Permit.

NON-MINING RELATED ACTIVITIES

To comply with a requirement from the Utah Division of Air Quality, a small meteorological station was installed on the south ridge near the Excess Spoil Disposal Area (See Plate 5-1). The weather station was installed during the Summer of 1994 in connection with the non-mining related activities of the adjacent cogeneration facility.

Terra-Tek, a drilling company, has been testing drill bits periodically since 1975 in an area in the western portion of the current SCA Permit Area. They generally drill to a maximum depth of about four feet. The area where drilling typically occurs is identified on Plate 5-1. Sunnyside Coal Company allowed Terra-Tek to conduct these non-mining related activities while the area was part of their permit. SCA will likely allow the drilling to continue until such time as it conflicts with the SCA operations. The Division was notified by letter dated March 17, 1993 of SCA's intentions regarding Terra-Tek.

527 TRANSPORTATION FACILITIES

The roads within the SCA Permit Area are shown on Plate 5-2. Also included on Plate 5-2 is a table showing widths, grades and lengths of each road within the SCA Permit Area. Plates 5-2A and 5-2B show typical cross-sections for the roads and Plates 5-2C through 5-2J, excluding Plate 5-2I, include plan and profiles of each road.

Roads within the SCA Permit Area will be maintained during the permit period. Maintenance will consist of basic custodial care to control erosion, repair of structures and drainage systems, removal of debris from culverts and ditches, and replacement of road surface material as needed. Additionally, all unpaved roads being used by mobile equipment and other unpaved operational areas will be water sprayed and/or chemically treated as necessary to reduce fugitive dust as required by SCA's Air Quality Permit.

In the event of a catastrophic event, roads will be repaired as soon as possible after the damage has occurred. Furthermore, there are no plans to alter any natural drainage way, or make alterations involving a steep cut slope.

All transportation facilities will be properly maintained and then restored at the end of the cogeneration plant life to prevent damage to fish, wildlife, and related environmental values, as well as to prevent additional contributions of suspended solids to stream flow or runoff outside the SCA Permit Area. Appendix 5-7 includes a description of each road and structural stability calculations for the roadway embankments. Additional information on final reclamation of roads can be found in Chapter Ten. All transportation facilities meet or exceed the permanent program performance standards.

WASTE COAL HANDLING SYSTEM DESCRIPTION

The following sections discuss operations involving the use of the crushing facility. The crushing system utilizes the following units:

1. Waste coal receiving hopper (Truck Dump);
2. Transfer conveyors;
3. Primary and Secondary Crusher System;
4. Product Transfer/Stacking Conveyors/ Screen Station
5. Silo Storage/Transfer Conveyors; (Not in Permit Area)
6. Live-Storage Silos (Not in Permit Area).

The SCA Permit Area was enlarged to include the crushing units on May 16, 1994. The items 5 and 6 are not within the permit area. These facilities are associated only with the power plant operation and are not part of the mining process. The SCA crushing unit exists solely to appropriately size all material utilized in the SCA plant. This sizing is required regardless of the origination of the fuel. All material, whether it be run of mine ("ROM") coal or waste coal, will be run through the receiving hopper and crushed and sized accordingly.

It is anticipated that the SCA project will, in the best of circumstances, be required to purchase six to seven thousand tons of ROM coal per year. This coal will typically be utilized when the waste fines have been frozen and are less accessible. There may be other circumstances when ROM coal will be utilized by the SCA facility.

Plate 4-5 shows the location of the crushing facility in relation to the SCA Permit Site. Material to be burned in the plant is run through the crushing and conveyor system and stored in the silos based on the B.T.U. values, etc. Then, material is fed from the silos through a conveyor system into the power plant and the boiler. The fluidized bed boiler requires material to be crushed to a certain specification. Therefore, it is important the SCA crushing unit size the material correctly.

The waste coal pile owned by SCA represents approximately 23 years of fuel supply on the ground. If the SCC mine were to cease operation today, SCA could be required to transport material to its site, either mixing ROM coal with its current waste coal supply to extend the life of the pile, or purchasing additional waste materials from other sites. All these materials must go through the crushing system that SCA has on site to meet boiler specifications for fuel.

It is important to know that no matter where material is obtained, whether it be from SCA's DOGM permitted area, ROM coal, or waste material from another site, this material is all directly fed into the waste coal receiving hopper and sized and crushed accordingly. SCA is not unique in this process. All coal fired power plants have crushing units on site to prepare fuel for boiler specifications.

The following paragraphs include a detailed description of the waste coal handling system for the SCA cogeneration facility.

The handling system provides for receiving Waste Coal from two independent sources, including screening the material according to size, with the oversize material being crushed to a 1/4" top size, and storage in segregated, enclosed silo systems, (1,800 tons total capacity), according to Btu content, (high or low), for reclamation in a proportioned blend by the plant operating system (provided by others).

The system also provides for: weighing incoming material as it is received, with printed record; removal of metals via electro-magnet, with backup metal detection of the final product; and, the ability to segregate crushed product into an open, dead-storage pile for emergency reclamation, if needed. Dust control features of the system include totally enclosed live-storage silos and transfer points, covered conveyor systems and a water-spray type dust suppression system at transfer points, as needed.

Waste Coal Receiving Hopper

Material from the Waste Coal piles will be received in an 100 ton capacity, ramped, drive-over Waste Coal Receiving Hopper designed with slope angles to ensure the flowability of wet, sticky coal.

The hopper slopes are lined with high molecular weight plastic sheeting ("slick sheet") to enhance flowability as well as to act as a replaceable wear surface. Air cannons are provided in the lower hopper walls to provide for flow activation for the fine pond material. The hopper is open, above grade, on one side to provide a "push-in slot" for receiving coal by dozer when needed.

Dust control is accomplished with a water-type suppression system to "fog" the hopper volume during unloading of dry gob materials.

Transfer Conveyors

Waste coal flows from the Waste Coal Receiving Hopper on a slow-speed, troughing conveyor (200 tph effective capacity) which feeds a transfer conveyor (250 tph effective capacity) that feeds the Primary Crusher. The Receiving Hopper conveyor belt is a heavy duty 3-ply belt to resist bruising and tears at this high impact point of loading.

A self-cleaning electro-magnet is mounted on the transfer conveyor to remove metals. A metal detector is mounted over the transfer conveyor downstream of the magnet as a protection element for the screening/crushing system. Additionally, a belt scale system (+ 1/4% accuracy) weighs all incoming material, with printed record.

Primary and Secondary Crushers

The Primary Crusher receives material from the transfer conveyor and sizes it to a nominal 1.5" size. Crushed material from the Primary Crusher is deposited on the next conveyor which then feeds the Secondary Crusher Dust control for the Primary Crusher is a water-type suppression system.

The Secondary Crusher receives material from the Primary Crusher and sizes it to a nominal 1/4" size. A dust collection system is provided for the Secondary Crusher.

Product Transfer/Stacking Conveyors/Screen Station

Sized material from the Secondary Crusher flows onto a 36" Product Transfer conveyor (250 tph effective capacity) which transfers it to a 36" Radial Stacking Conveyor (250 tph effective capacity). The product is then conveyed either, to the Screen Station, to an open-pile for placement in dead storage, or to the Silo Storage Conveyor for transfer to the live-storage silos.

The single deck Screen Station separates the crushed product at 1/4". A 60" transfer conveyor takes the minus 1/4" product to the Transfer/Loader Hopper.

A 36" conveyor takes the plus 1/4" product from the screen to a temporary stockpile. This product is then transported to the Waste Coal Receiving Hopper (Truck Dump) to be reprocessed. A closed loop return conveyor transfers this material directly to be recrushed in the Secondary Crusher without the need for the temporary stockpile

A 24" Transfer Conveyor and a 30" Radial Stacker transfer a portion of the screened product from the Screen Station to an open pile for dead storage.

Dust Control for the Product Transfer and Stacking Conveyors and the Screen Station is a water-type suppression system and is applied as follows: immediately following the Secondary Crusher, at the transfer point between the 36" Product Transfer Conveyor and the 36" Radial Stacker, and at the outlet of the Screen Station.

The Transfer/Loader Hopper is mounted above the Silo Storage Conveyor. The Transfer/Loader Hopper is lined with slick sheet.

Silo Storage/Transfer Conveyors

The Silo Storage/Transfer Conveyors are located adjacent to the Permit Area and are associated with the power plant operation. The Silo Storage Conveyor is a stationary, troughing conveyor (250 tph effective capacity), which conveys product which has either been transferred directly from the Radial Stacking Conveyor, or reclaimed from the dead storage pile, to a transfer point on top of the first of three Live-Storage Silos.

Transfer points on top of each silo are semi-enclosed, with Y-gate chutes on the first two silos to direct the product into the silo, or onto the Silo Transfer Conveyors which connect to adjacent silos. The chute work is lined with slick sheet to enhance flowability.

Live-Storage Silos

The Live-Storage Silos are not located within the Permit Area. They are not associated with the mining operations. The three Live-Storage Silos are steel, totally enclosed cylindrical silos with cone hoppers (23,950 cubic feet total capacity each). Hopper angles are a minimum 60 degrees to ensure free flow of material during reclamation A manually-operated, positive shut-off gate is included at the hopper outlet to provide for maintenance of adjacent mechanical equipment (to be provided by others).

Other silo features include bin level indicators and air-cannon flow activators. The silos are mounted with the outlets at the appropriate level, near grade, to provide for transfer of material by feeder systems onto the plant feed conveyor (to be provided by others).

528 HANDLING AND DISPOSAL OF COAL MINE WASTE

The applicability of Section 528 is related to handling of excess spoil and coal mine waste only. Details on the excavation of the coal mine waste can be found in Chapter Nine, Sections 9-6 through 9-7.

Excess Spoil Disposal Area

Excess spoil will be placed in the Excess Spoil Disposal Area, designated on Plates 9-1A, 9-1B, 9-1C and 9-1D in a controlled manner to ensure mass stability and prevent mass movement during and after construction. The

disposal site will be designed and constructed to ensure that leachate and drainage from the area is controlled and does not degrade surface or underground water. Wastes will be routinely compacted and covered to prevent combustion and wind-borne waste. When the disposal is completed, a minimum of eighteen inches of soil cover will exist over the site and the site will be revegetated in accordance with the approved reclamation plan.

The Excess Spoil Pile will be inspected as required in Section 514.

Additional information concerning spoil disposal is outlined in Chapter Nine and Appendix 9-5.

Slurry Ponds

Fine refuse from the SCC preparation plant is moved to dewatering or disposal areas by slurry transport in an open ditch. There are four slurry ponds that lie within the SCA Permit Area: the West Slurry Cell, the East Slurry Cell, Slurry Pond One, and Slurry Pond Two Plates 7-4, 7-5, and 7-12 show coal slurry water sediment control system plans, slurry ditch and surrounding areas, and the location of the East and West Slurry Cells, respectively. The East and West Slurry Cells are settling and evaporating impoundments that were constructed prior to or during 1974. Slurry Ponds One and Two are settling ponds. Presently, during operation of the SCC preparation plant, Slurry Pond One and Slurry Pond Two are actively used, while the East Slurry Cell is used as an overflow for Slurry Ponds One and Two when they are not in service. The West Slurry Cell is used as a disposal area for dried slurry from Slurry Ponds One and Two.

The West Slurry Cell was the first impoundment to be constructed for the disposal of slurry and coal mine waste in the late fifties to early seventies (Appendix 5-2). Coal mine waste and other waste was used as fill material to block a wash in the pediment material at the mouth of Whitmore Canyon overlooking the Icelander Drainage. Slurry from the preparation plant was transported to the impoundment by ditch for disposal. As the level of the slurry increased, additional coal mine waste was added to the top and sides of the impoundment. The present level of the slurry in the impoundment is over 200 feet above the bottom of the wash. Currently, the impoundment is used as a disposal area for dried slurry material from Slurry Ponds One and Two. Trucks end-dump the slurry material onto the northwest side of the cell from the top of the dike. A large dozer then spreads and compacts the material.

The East Slurry Cell was constructed in 1974 on the east side of the West Slurry Cell. Coal mine waste was placed and compacted in dikes. After the dikes were completed and covered with soil material, the impoundment was filled with slurry. Since 1983, the impoundment has been used as an overflow for Slurry Ponds One and Two.

Slurry Ponds One and Two were constructed in 1978 to the north of the East and West Slurry Cells. These ponds were constructed by excavating a depression in the colluvium at a gentle slope. Material from the depression was spread out down slope of the ponds for approximately 50 to 100 feet. Slurry Ponds One and Two are used in rotation. Slurry is introduced into a pond where it settles and is then filtered. During the use of the first pond, the second pond is decanted and the dried slurry removed by truck to the West Slurry Cell. After the second pond is cleaned, the cycle is reversed. If both ponds are in the drying and cleaning cycle, the slurry is diverted to the East Slurry Cell. Water from Slurry Ponds One and Two is discharged into the Clear Water Pond (UPDES Outfall #004) and then discharged to Icelander Drainage. The East and West Slurry Cells are shown on Plate 7-12.

All surface drainage from the areas above the slurry ponds is diverted away from the embankments by diversion ditches designed to carry the peak runoff from 100-year, 6-hour precipitation event (Appendix 7-3). The

diversion structures will be maintained to prevent blockage.

Visual inspections by a qualified registered professional engineer or a qualified MSHA impoundment inspector will be conducted according to 30 CFR 77.216-3 and/or R645-301-514.300 to assess the stability of the impoundments and determine the amount of seepage, if any.

Subsidence will not affect the ponds and embankments since the structures do not overlie the coal seam and are located several miles west of the nearest outcrop. Mud flows, rock debris falls or other landslides are not expected to be a problem because the embankments are located at or above the level of the surrounding topography. Possibility of failure downhill of the embankments is limited to a thin layer of colluvial material on bedrock. Failure of this material would not threaten the embankments.

Coarse Refuse

Detailed cross sections and grades for the Coarse Refuse Pile and Slurry Cells are shown in Plate 5-6. This plan shows the limits of the coarse refuse pile, as well as the slurry cells.

The coarse refuse disposal area is located on and is part of the west embankment of the West Slurry Cell. The West Slurry Cell was constructed in the late 1950's to impound coal slurry from the Sunnyside mine's preparation plant. Coarse refuse material was added to the top and sides of the impoundment as the slurry level increased. The West Slurry Cell ceased being used as a settling pond in 1975 when the East Slurry Cell was built. Since that time, SCC has continued to use the west embankment of the West Slurry Cell as the coarse refuse disposal area to stabilize the embankment and ultimately allow future use of the West Slurry Cell.

The existing coarse refuse pile was built in lifts by leveling end dumped piles of material. The coarse refuse pile maintains a maximum 27 degree (2 horizontal:1 vertical) outslope and is terraced on 50-foot vertical increments. The terrace is a minimum 20-foot wide and is gently sloped to control surface water runoff and control erosion.

Geotechnical investigation of the West Slurry Cell embankments were conducted in 1984 and again in 1986. The 1984 work (Appendix 5-3) indicated that the West Slurry Cell embankment above the active coarse refuse disposal area was not stable with a static safety factor of 1.03. The study concluded that a safety factor of 1.46 would be obtained by maintaining maximum slopes of 2 (h) : 1 (v) and maintaining a moist compacted material density of 100 lbs per cubic foot. SCC continued stabilization of the west embankment by wheel compacting coarse refuse in lifts, maintaining 50-foot high benches at a maximum 2 (h) : 1 (v) slope, and establishing a minimum 20-foot terrace at every bench.

A 1986 report (Appendix 5-5) developed for a proposed coarse refuse pile expansion to the north of the existing coarse refuse pile, concluded a 2 (h) : 1 (v) slope between 50-foot high benches and terraces of 30-feet in width, while maintaining a moist compacted material density of 100 lbs per cubic foot provides an adequate factor of safety (greater than 1.5) under static conditions.

Cross-sections C-C', D-D', and E-E' (shown in Plate 5-6) indicate the coarse refuse pile embankment maintained the slope and bench criteria established in the geotechnical investigations. Recent in-place density testing (Appendix 5-6) indicated moist compacted densities greater than 100 lbs per cubic foot as established in the geotechnical investigations.

The coarse refuse pile will be in a state of ongoing excavation throughout the permit period. A side view of the coal mine waste excavation is shown in Figure 5-1. Excess spoil material and coal mine waste not suitable as fuel will be separated from the combustible material going to the Cogeneration Plant; transported and placed in a controlled manner in horizontal lifts not exceeding four feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material if required. The Excess Spoil Pile area shown in Plates 9-1A, 9-1B, 9-1C, and 9-1D.

All surface drainage from the area above the refuse pile will be diverted away from the fill into stabilized diversion channels designed to pass safely the runoff from a 100-year, 6-hour precipitation event. Calculations are found in Appendix 7-3.

The refuse pile will be inspected as outlined in Section 514.

Maintenance of the embankments will consist of filling and grading any erosion or other failure features discovered by the above inspections. Ditches on the terraces will be cleaned and graded as need warrants. Riprap in the drainage system will be repaired as needed.

Subsidence will not affect the refuse pile as the structure does not overlie the coal seam and is several miles west of the nearest outcrop. Mud flows, rock debris falls, or other landslides are not expected to be a problem. Possibility of failure near the sides and downhill of the refuse piles is limited to a thin layer of colluvial material on bedrock. Failure of this material would not threaten the refuse pile.

Burning and Burned Waste Utilization

Coal mine waste fires will be extinguished by covering the burning material with non-combustible material. Only those persons authorized by the operator, and who have an understanding of the procedures to be used, will be involved in the extinguishing operations. No burning or burned coal mine waste will be removed from the permit disposal area without a removal plan approved by the Division. Consideration will be given to potential hazards to persons working or living in the vicinity of the structure.

Burned coal waste material encountered during excavation of the Coarse Refuse Pile will be disposed of in the Excess Spoil Pile.

Industrial waste

An industrial waste dump was located at the northeast end of the East and West Slurry Ponds in the refuse disposal area. The dump was constructed and used by excavating a trench, compacting the sides and bottom for a water barrier, and then covering the waste with a minimum of two feet of borrow material. It was closed as outlined in Chapter Nine.

529 MANAGEMENT OF MINE OPENINGS

529.100 thru 529.400 Mine Openings

There are presently no mine openings within the SCA Permit Area, nor are there expected to be in the future. Thus, the discussion of sealing or management of mine openings is not applicable and is not discussed in further detail.

530 OPERATIONAL DESIGN CRITERIA AND PLANS

531 GENERAL

The following sections include general plans for each proposed sediment pond, water impoundment, coal processing waste bank, dam, and embankment within the SCA Permit Area. The SCA Permit Area is not threatened by subsidence of subsurface strata, therefore, the plans will not include discussions of this nature.

532 SEDIMENT CONTROL

The hydrologic design calculations for the sediment ponds are included in Appendix 7-3. These calculations outline the criteria, assumptions, and parameters used in order to design a structure that would be adequate to control sedimentation. Details are discussed in Chapter Seven, Hydrology, Section 740.

There is a system of collector ditches throughout the SCA Permit Area to collect runoff from roads and disturbed areas. These flow into sediment ponds that are located throughout the permit area. These ponds outfall into Icelander Creek tributaries, if they fill to their decant drains. The discharges are subject to the UPDES permit limitations discussed in Chapter Seven, Hydrology.

The permitted operations in the SCA Permit Area include excavations of the refuse piles, crushing the refuse and transportation of the refuse to the neighboring power plant site. The probable hydrologic impacts are expected to change very little with the inclusion of the excavation activities. The disturbance of the refuse piles caused by the excavation may increase sediment yield from these areas. The control of the extra sediment is discussed in Chapter Seven, Hydrology, Section 730.

533 IMPOUNDMENTS

See Sections 514 and 528.

534 ROADS

534.100 thru 534.340 Road Requirements

A maintenance plan for all unpaved roads is outlined below and is in accordance with requirements of both DOGM and the Division of Environmental Health. In the event that existing roads are retained under an approved post-mining land use, maintenance will continue as outlined in this section and section 527 The only post-mining land use plans for some existing roads within the SCA Permit Area are to allow occasional access to existing easements through the Permit area. These roads are identified on the Reclamation Plans.

All unpaved roads and other unpaved operational areas which are used by mobile equipment will be water sprayed and/or chemically treated to reduce fugitive dust as required by SCA's Air Quality Permit. A copy of SCA's Air Quality Permit is located in Appendix 4-2.

535 SPOIL

The disposal of spoil material is outlined in Chapter Nine.

536 COAL MINE WASTE

536.100 thru 536.900 Coal Mine Waste Disposal

See Section 528 and Chapter Nine, Sections 9.6 and 9.7.

540 RECLAMATION PLAN

541 GENERAL

See Chapter Nine, Mining Plan for details on contemporaneous reclamation. Chapter Ten, Reclamation Plan includes details on final reclamation. Reclamation cost estimates are detailed in Chapter Eight, Bonding.

542.400 Abandonment

Before abandonment of the SCA Permit Area or before seeking final bond release, SCA will ensure that all temporary structures were removed or reclaimed and that permanent structures have been maintained properly and meet the requirements of the reclamation plan.

542.500 Sediment Ponds and Ditches

All sediment ponds, mine water discharge ponds, and ditches no longer needed when the reclamation of the disturbed areas is completed will be re-contoured and revegetated.

542.600 Roads, Culverts, and Bridges

All roads not needed to provide access to the easements crossing the Permit Area, and associated structures will be reclaimed. The culverts will be dug up, removed, and disposed in an approved landfill or otherwise abandoned by filling the culvert to reduce the potential of piping. The roads and their ditches will be ripped, contoured and revegetated.

542.700 Final Abandonment of Disposal Area

Following the excavation of the coal mine waste the remaining material will be regraded to approximately re-establish the surface contours that existed before mining operation disturbances Revegetation efforts will be initiated following the excavation and regrading activities. See Chapter Nine, Mining Plan for details on contemporaneous reclamation. Chapter Ten, Reclamation Plan includes details on final reclamation.

550 RECLAMATION DESIGN CRITERIA AND PLANS

Approximately 75 percent of the disturbed portions of the SCA Permit site was originally disturbed prior to the current reclamation laws. Plate 5-7 identifies the previously-mined areas.

See Chapter Nine for contemporaneous reclamation details. See Chapter Ten for final reclamation details.

560 PERFORMANCE STANDARDS

Coal mining operations will be conducted in accordance with this permit as approved and with the performance standards of the permanent program.

Primary Roads

- Graded to a minimum side slope of 2%.
- Minimum six-inch cut ditch to collect drainage.
- Dust control techniques actively applied on roads being used by mobile equipment as needed to meet the requirements of the approved Air Quality Permit issued by UDEQ.

Ancillary Roads

- Graded and maintained to adequately serve the purpose of providing access as needed.

Sediment Ponds

- Operated and maintained to protect against any discharge which exceeds the limits set by the approved UPDES Permit issued by UDEQ.
- Periodically monitored, and sampled if needed, as required by the UPDES Permit
- Sediment level will not reach an elevation higher then the inlet to the decant drain pipe.
- Sized adequate to contain and/or treat the 10-year, 24-hour precipitation event.
- Side slopes not steeper than 2H:1V.
- Spillway adequately clean and clear from sediments or debris to allow safe discharge of the 25-year, 6-hour precipitation event.

Topsoil Storage

- Adequate berm maintained to contain and/or treat runoff from the 10-year, 24-hour precipitation event.
- Cross-sectional storage area between the berm and the stockpile not less than the minimum required in Appendix 7-7.
- Rills and/or gullies deeper than 9-inches will be filled, graded, or otherwise stabilized.

Siltation Fences

- Filter fabric embedded into the ground at least 6-inches.

- Fence post embedded adequately to provide stability.
- Fencing material adequately attached to the filter fabric and to the fence posts to provide support to the fabric.

Straw Bales for Sediment Control

- Adequately installed and maintained to direct runoff through the bale rather than allowing flows around or under the bale.

- Deteriorated bales shall be replaced or supplemented with an additional bale if the area being treated still requires additional sediment control.

Diversions/Culverts

- Side slopes no steeper than 2H:1V.
- Of adequate cross-section to safely pass the design storm without overtopping the banks or floodplain.
- If extensive erosion or siltation occurs which inhibits the diversion or culvert from passing the design storm or which contributes excessive sediment to the receiving storm, maintenance will be provided. This maintenance may include excavating or shaping the diversion to line, grade and cross-section to meet the design criteria specified in Chapter 7.

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700 HYDROLOGY

710 thru 712 INTRODUCTION

Sunnyside Coal Company's (SCC) refuse disposal area has been acquired by Sunnyside Cogeneration Associates (SCA) to serve as a long-term supply of waste fuel for its coal mine waste-to-energy facility, located adjacent to the SCA Permit Area. SCA has contracted with SCC to provide alternative disposal for coal mine waste generated by SCC, both past and future. SCA's alternative energy project has been approved by the Federal Energy Regulatory Commission as a Qualifying Facility, based on the usage of coal mine waste as fuel in its fluidized-bed combustion boiler. SCA will use both "active waste", from the processing plant, and "accumulated waste", from the refuse pile, as sources of waste fuel for the facility. SCA's fueling plan will require excavation of coal mine waste from the existing refuse pile, beginning as early as January 1993, and continuing for approximately thirty years.

Based on SCA's contract for the sale of electricity to Utah Power and Light, handling coal mine waste to serve as an alternative energy fuel will be a consistent and continuous process. Coal mine waste that continues to be generated by SCC's preparation plant will also be factored into SCA's fueling strategy, which can allow direct acceptance of coal mine waste at the facility, or temporary placement within the refuse disposal area prior to utilization.

SCA will excavate coal mine waste from the refuse disposal area based on detailed sampling and analyses and a materials handling plan which will be continuously updated by SCA. Excavation of the coal mine waste will be considerate of material quality, pile and embankment stability, and mine operation. Over the life of SCA's facility, nearly all of the coal mine waste will be burned to generate electricity, resulting in significantly less material that will need final reclamation. Final reclamation of the refuse pile will be accomplished after all of the coal mine waste is either burned as a fuel, or repositioned within the refuse disposal area for final disposal, if determined to be non-combustible (i.e., ashes, rock).

The information in this chapter includes hydrologic resources (both surface and groundwater), proposed operations and potential impacts on hydrology, methods and calculations used in hydrologic design. Performance standards and reclamation activities are discussed in Chapter Nine and Ten.

Cross sections, maps, plans, and analytical data included in this chapter have been taken from previous applications for the SCC mines on file at the Utah Division of Oil Gas and Mining (DOGM); or from previously issued reports prepared by other consultants. As such, the appropriate cross sections, maps, and plans were certified by the authors. It should be noted that Eckhoff, Watson and Preator Engineering has compiled and relied on data and maps from previous approved permits for the SCC mines. The hydrology section has been appended to reflect the SCA Permit Area. In this chapter where the "permit area" is referred to, the SCA Permit Area is to be assumed unless the larger overall area for the SCC is specifically referred to in the text as the "original SCC permit area."

Currently, there are activities that occur outside the Sunnyside Cogeneration Associates Permit Boundary that have significant bearing on the operations of the SCA Cogeneration facility and the SCA Permit Area. These activities occur in conjunction with the SCA permit site.

As discussed in other areas of the PAP, Sunnyside Coal Company's (SCC) refuse disposal area has been acquired by SCA to serve as a long-term supply of waste fuel for its coal mine waste-to-energy facility, located adjacent to the SCA Permit Area. SCA has contracted with SCC to provide alternative disposal for coal mine waste generated by SCC, both past and future. In order for SCA to acquire the quality and quantity of fuel for the cogeneration facility, coarse refuse is accepted from the SCC mine on a continual basis. The refuse is stockpiled in designated areas within the SCA permit site then mixed with existing refuse on the SCA permit site and transported to the cogeneration facility. These operations; acceptance of coarse refuse from the SCC mine and the transporting of coarse refuse to the cogeneration facility, requires access roads that extend beyond the limits of the SCA permit boundary. The main access for the transferring of coarse refuse from the SCC mine begins at the SCC mine and extends to the northeast side of the SCA Permit boundary. To transport coarse refuse from the SCA Permit Area to the cogeneration facility, the access road lies within the SCA permit boundary.

In addition to the access roads mentioned above, there are access roads to the south of the SCA permit boundary that are utilized for the purposes of the SCA operations. These roads are utilized to access areas of the SCA permit site that are inaccessible from the north side of the permit area. They are used by authorized contractors of SCA for the purposes of such activities as: water quality monitoring, periodic inspections, and site maintenance as needed.

Activities that occur outside the SCA Permit Area also include watersheds outside the permit area that drain into contained areas within the permit area. Chapter Seven of the PAP outlines these watersheds and the areas to which they drain. Also included are detailed maps and calculations showing the amount of water from each watershed and the capacity of the drainages and ponds that were constructed to contain them. In some instances, a drainage commencing within the SCA Permit Area may extend beyond the limits of the SCA permit boundary. An example of this is the outlet of the Pasture Sediment Pond. In such cases, SCA has provided the necessary information to the Division to show its adequacy to handle the required storm event. All disturbed area runoff is diverted into approved sediment ponds. In the event that this occurs elsewhere within the permit area, SCA will handle each instance on a case-by-case basis and notify the DOGM of any proposed changes to the PAP.

It should be noted that the SCA operations encompass a number of entities that do not necessarily lie or operate within the permitted area. The non-mining related activities that occur outside of the permitted area are done so in a controlled manner, under permits from other agencies, and have been incorporated into the entire design and plan of the SCA Cogeneration facility. SCA understands the implications of utilizing entities outside of the permitted area and commits to maintaining the areas in accordance with applicable requirements.

713 IMPOUNDMENT INSPECTIONS

There are eleven existing impoundments within the SCA Permit Area which have been, and will continue to be used during the operation and reclamation periods. These impoundments will control sediment from SCA's refuse excavation activities as well as some of the SCC mining operations. The impoundments are described in sections 732 and 733. All impoundments will be inspected quarterly for structural stability and proper performance by a qualified individual, in accordance with R645-301-514.300, as required in regulation 713. A copy of the inspection report will be promptly sent by SCA to the Division, as required.

720 ENVIRONMENTAL DESCRIPTION

721 HYDROLOGIC RESOURCES

This section of the Permit Application describes the groundwater and surface hydrology for the SCA Permit Area, and adjacent areas. Cross sections and maps showing the locations of subsurface and surface hydrologic features are described here, and are found in the exhibits of this chapter. The locations of monitoring stations used to gather baseline data on water quality and quantity are provided in these maps.

Groundwater has been encountered in the permit area on a limited basis. The various drilling records discussed in Chapter Six do not indicate the presence of groundwater in any of the holes drilled in the SCA Permit Area. This includes some holes over 200 ft deep, which reach the bed rock.

The only perennial surface stream within the SCA Permit Area is Icelander Creek. Grassy Trail Creek, which drains Whitmore Canyon, is a perennial stream which flows through the area immediately north of the SCA Permit Area. Tributaries to Icelander Creek flow around both the northwest and the south borders of the SCA Permit Area. The surface water hydrology is discussed in greater detail in various sections of this chapter.

A more detailed description of surface and groundwater hydrology is found within Section 722 with water quality issues being discussed in Section 724.

722 CROSS SECTIONS AND MAPS

A list of plates that are applicable to the SCA Permit Area are included in the General Table of Contents.

722.100 Location and Extent of Subsurface Water

As discussed in Section 721, drilling records of the SCA Permit Area show that little groundwater was encountered in the holes drilled in the SCA Permit Area. This includes drill holes over 200 ft. deep and into bedrock.

722.200 Location of Surface Water Bodies

The natural surface streams in and adjacent to the SCA Permit Area include Grassy Trail Creek (north of the SCA Permit Area) and Icelander Creek tributaries (border the northwest and southern portions of the SCA Permit Area). No water from Grassy Trail Creek enters the permit area, and no water from the SCA Permit Area discharges into it. Therefore, Grassy Trail Creek is not discussed further in this chapter.

West of the northern portion of the SCA Permit Area is a spring which feeds Icelander Creek. The location of this spring is shown in Plate 7-2. It is labeled by its monitoring station number, F-2.

The SCA Permit Area has been used as the refuse disposal area for the SCC mines for many decades. Seven sedimentation ponds have been constructed in the area, with collector ditches, to control runoff sediment from the roads and disturbed areas. Other existing water bodies include four slurry ponds used in the disposal of coal fines from the Sunnyside mine processing plant. Slurry from the plant carries the fines to the

ponds in the slurry channel.

The locations of all the water bodies mentioned above are shown on Plates 7-1 and 7-6. All water bodies mentioned above, except Grassy Trail Creek, are discussed in more detail in various sections of this chapter.

722.300 Location of Monitoring Stations

The Surface and Groundwater Monitoring Locations~~baseline water quality monitoring stations~~ are shown on Plate 7-2. The locations of UPDES water monitoring sites are shown separately on Plate 7-3.

722.400 Location of Water Wells

There is only one water well within a 1 mile radius of the SCA Permit Area. It is located north of the western portion of the permit boundary near the railroad tracks. The well location is shown in Plate 7-2. This well is certified as having a 200 ft collection gallery which begins at the bottom of a 48 ft. The water right is described in section 724.100.

722.500 Contour Maps

The contours of the SCA Permit Area are shown in Plate 7-1. The topography of the area is also shown in cross sections AA', BB', and CC', (Plates 6-4 through 6-6). Cross section locations are shown in Plate 6-3.

723 SAMPLING AND ANALYSIS

All water quality analyses and sampling will be performed according to the methodology set forth in the current edition of "Standard Methods for the Examination of Water and Wastewater" or according to the methodology in 40 CFR Parts 136 and 434.

724 BASELINE INFORMATION

724.100 Ground Water Information

An underground water rights search showed one appropriated water well in the area adjacent to the SCA Permit Area. The water rights are held by East Carbon City, but will be used by SCA in the cogeneration facility pursuant to a contract. The certificate of appropriation is shown in Figure 7-1. The search was conducted on a one mile radius around the south quarter corner of section 6, T 15 S, R 14 E. The results of the water rights search are shown in Figure 7-2.

There is a spring approximately 1/4 mile west of the SCA Permit Area. This spring and the East Carbon City well are both shown in Plate 7-2. The spring, labeled F-2, flows into Icelander Creek, and becomes subject to the water rights and irrigation uses of Icelander Creek. This spring is also the subject of a contract between East Carbon City and SCA. The water from the spring will be used in the cogeneration facility. Baseline water quality data is found in Appendix 7-4.

The Coarse Refuse Seep emerges near the toe of the existing Coarse Refuse Pile. This seep is the subject of a special study being conducted (1994-1995) by SCA in coordination with DWQ. The operations of SCA are

expected to have a net improvement on the water quality in this area.

724.200 Surface Water Information

Icelander Creek

Tributaries to Icelander Creek are found near the northwest and southern boundaries of the SCA Permit Area. One tributary lies just outside of the northwestern border, another tributary cuts in and out of the southern border. The Utah Division of Water Quality has classified Icelander Creek as 3C (protected for non-game fish and other aquatic life, including the necessary organisms in their food chain), and 4 (protected for agricultural uses including irrigation of crops and stock watering).

Slurry Water

The only water flowing onto the SCA Permit Area is in the slurry ditch from the SCC preparation plant. This slurry water is filtered in the slurry ponds and further settles in the Clear Water Pond, or it is sent to the East Slurry Cell and evaporated. Outfall from the Clear Water Pond is channeled to the Icelander tributary north of the SCA Permit Area.

Drainage and Sediment Control System

There is a system of collector ditches throughout the area to collect runoff from roads and disturbed areas. These flow into the sedimentation ponds found periodically around the permit boundary. These ponds outfall into the previously mentioned Icelander tributaries, if they fill to their decant drains. The discharges to the Icelander drainage must be adequate in quality to be suitable for the irrigation uses downstream. The discharges are subject to the UPDES permit limitations discussed later in this chapter. Siltation fences may be placed as needed to improve erosion control.

The sedimentation ponds are described as follows:

Outfall No.	Location	
004	Clear Water Pond Lat: 39° 32' 52" Long: 110° 23' 11"	Mine water discharged from coal preparation plant to slurry settling pond. Outfall is to Icelander Creek.
007	Rail Cut Pond Lat: 39° 32' 14" Long: 110° 23' 48"	Surface runoff discharged from sediment ponds to Icelander Creek.
008	Old Coarse Refuse Pond Lat: 39° 32' 20" Long: 110° 23' 03"	Surface runoff discharged from sediment ponds to Icelander Creek.

Outfall No.	Location	
009	Pasture Pond Lat: 39° 32' 36" Long: 110° 23' 58"	Surface runoff discharged from sediment ponds to Icelander Creek.
012	Coarse Refuse Toe Lat: 39° 32' 28" Long: 110° 23' 58"	Surface runoff discharged from sediment ponds to Icelander Creek.
014	Coal Pile Sediment Pond Lat: 39° 32' 38" Long: 110° 23' 32"	Sedimentation Pond to contain runoff from the crushing areas. Discharge to Icelander Creek.
016	Borrow Area Pond Lat: 39° 32' 25" Long: 110° 23' 45"	Sedimentation pond containing runoff from soil borrow area. Discharge to Icelander Creek.

The Surface and Groundwater Monitoring Locations shown on Plate 7-2 and listed in Appendix 7-8 on Table 7-2A were monitored for two years (June 1993-1995) according to the Baseline parameters listed in Table 7-2B. This baseline data has been analyzed and incorporated into Appendix 7-4.

The baseline data presented in Appendix 7-4 appears to indicated the following attributes:

- The decreased flows and temperature and the increased pH at the Coarse Refuse Seep Monitoring sites indicate that previously alledged flows through the refuse pile from slurry dewatering in the East Slurry Cell have either ceased or have been substantially reduced to a neglegible amount.

- The stiff diagrams for the Coarse Refuse Seep monitoring sites indicate that the CRS, CRC, and CRB have similar water quality characteristics. They are rich in sulfate, magnesium, and calcium.

- The stiff diagrams for the Dragerton Well, Icelander Creek and F-2 Whitmore Spring monitoring sites indicate that they have similar water quality characteristics. They have a balanced chemistry of Sodium and Sulfate and moderate amounts of Magnesium. These stiff diagrams also indicate that Icelander Creek has not been significantly affected by the characteristics (such as higher sulfates) at the Coarse Refuse Seep.

- The Total Dissolved Solids (TDS) of CRS, CRC and CRB samples was much higher than at the Dragerton Well, Icelander Creek and F-2 Whitmore Spring.

The water quality data shows that the discharge from station 004 (Clearwater Pond) generally meets the limitations of the UPDES permit. The other sediment ponds do not generally have discharge.

There is an additional area located north of the Clear Water Pond which has surface runoff that does not discharge into a sediment pond. The Best Technology Currently Available (BTCA) will be implemented for this area. It should be noted that the information included in this chapter concerning this area is supplemental to information and data implemented in the SCC PAP.

The area is approximately 0.4% (1.0 acres) of the Total Disturbed Area. This area will not cause impacts to the soil resources nor are there anticipated impacts to the vegetative and/or wildlife resources. The area currently lies in the "Post-Disturbed Area" as shown on Plate 3-1. The vegetative cover protects the area from wind and water erosion, thus, additional sediment and/or erosion control methods will be unnecessary.

724.300 thru 724.320 Geologic Information

The geology of the surrounding areas described in detail in section R645-301-624. In summary, the SCA Permit Area consists of alluvial fan deposits overlying pediment deposits, which overlay a deep Mancos Shale layer. The Mancos Shale is exposed along the southern border of the permit area. The combined

alluvium and pediment deposits range from in thickness from a few feet to about one hundred feet. This natural geology has since been overlaid with refuse in several areas of the SCA Permit Area.

There has been very little groundwater encountered in the SCA Permit Area drilling explorations, and consequently the proposed operations are projected to have a negligible effect on groundwater. The operations will not affect the surface water quality. The proposed excavations will be designed such that the existing and sedimentation ponds will not be disturbed.

724.400 thru 724.410 Climatological Information

A statement of climatological factors which are representative of the SCA Permit Area are included in sections 724.411 thru 724.413. These factors include estimates of average precipitation, prevailing winds, and seasonal temperature ranges. Climate averages and data were obtained from The Utah Climate Center at Utah State University. The data tables are found in Appendix 7-2. The measurements were made at the Sunnyside mine weather station, which operated from 1984 thru 1988, and at the Sunnyside City Center station which has operated since 1989. The averages reported here are from the five years of data measured at the Sunnyside mine station.

724.411 Average Precipitation

The average annual precipitation for the Sunnyside area is 15 inches The rainfall amounts are fairly evenly distributed from March to November, averaging 1.4 inches per month. The total snowfall accumulations average 41 inches per winter. Snow can begin in October and can continue through April.

724.412 Average Wind Direction and Velocity

The Utah Weather Guide estimates that the wind velocities, in the area of the Price weather station, average 3.3 miles per hour for an entire year. March and April have the highest wind averages. The average velocity for these months is 5 miles per hour for the entire month. No prevailing wind direction is listed in the Weather Guide.

724.412 Seasonal Temperature Ranges

The hottest month in the Sunnyside area is July. The average maximum temperature for a day in July is 82°F, the average minimum temperature is 54°F. The coldest month is January, with an average daily maximum of 33° F, and an average daily minimum of 12.9° F.

724.420 thru 724.500 Additional Information

No additional or supplemental information has been requested by DOGM at this time.

724.600 Survey of Aquifer Recharge Lands

Groundwater aquifers have not been encountered in the SCA Permit Area. The drilling records presented in Chapter Six, Geology, suggest that if an aquifer does exist, that it is deep in the Mancos Shale layer, or lower. The proposed operations will therefore have negligible effect on groundwater aquifers.

724.700 Alluvial Valley Floor Determination

The following discussion demonstrates that the SCA Permit Area and the downstream areas receiving discharge from the SCA Permit Area are not appropriately classified as alluvial valley floors. The proposed operations should therefore not be subject to the special requirements of R645-302.320.

Statutory language specifically excludes "upland areas" for consideration as alluvial valley floors [P.L. 95-87, 701(1)]. The areas to be excluded from consideration include the upper portion of alluvial fans, pediment surfaces, etc. Areas underlain by bedrock and covered with residual weathered material and debris deposited by sheet and rill wash are also upland areas.

All of these descriptions can be applied to the SCA Permit Area. The geology of the SCA Permit Area consists primarily of alluvial fan and pediment deposits, at the base of the Book Cliffs, in the lower Price River drainage. In the steeper southern and western portions of the SCA Permit Area the bed rock Mancos Shale layer is very near the ground surface. Just a few feet of sheet and rill wash cover this layer. Further to the south and west is an area classified as additional alluvial fan deposits.

Icelander Creek tributaries flow through the areas to the south and to the northwest of the SCA Permit Area, however, it is a small creek and has carved only a shallow channel in the alluvial fan deposits. All the surface discharge from the SCA Permit Area flows into the Icelander drainage.

In 1985, the Division found that Grassy Trail Creek, from approximately five miles east of East Carbon City to the confluence of Grassy Trail Creek with Slaughter Canyon, was the only Alluvial Valley Floor (AVF) within the Permitted Area of Kaiser Coal Corporation. At the recommendation of DOGM, SCA has included a copy of Plate III-29 from the Kaiser 1985 permit for the purpose of delineating the designated AVF (see Figure 1 of Appendix 7-9).

The area now identified as the SCA Permit Area was then included in the Kaiser Coal Permit Area. However, the area identified as an AVF is not part of the SCA Permit Area. The AVF is located to the northeast and at a higher elevation from the SCA Permit Area.

The Division further found that the proposed operation of Kaiser Coal "will include neither the extraction of coal nor will significant physical disturbance of the surface or groundwater regime associated with the AVF occur and that mining activities actually enhance farming activities on the AVF."

The Division thus waived the requirements of UMC785.19(d) and (e) and UMC822 which deal with additional technical information, findings, and performance standards required of operations affecting designated AVFs. (See Appendix 7-9).

The proposed operations of SCA, which include excavating the coal refuse pile deposited by the operators of the Sunnyside Coal Mine, are expected to result in a net improvement to water quality.

SCA requests that the Division wave the requirements which deal with additional technical information, findings, and performance standards required of operations affecting designated AVFs.

725 BASELINE CUMULATIVE IMPACT AREA INFORMATION

725.100 thru 725.300 Hydrologic and Geologic Information

Hydrologic and geologic information from federal and state agencies has been used to generate this Permit Application. Other information was gathered from studies and surveys conducted by SCA, or its predecessors in this project. A great deal of information regarding potential impacts on the hydrologic balance of the area by the proposed excavation and reclamation activities was obtained from studies and surveys conducted by SCC or their predecessors at the Sunnyside mines. The information presented in this Permit is provided as a resource for DOGM use to assess the probable cumulative hydrologic impacts of the proposed excavation and reclamation operations on surface and groundwater systems in the cumulative impact area as required by R645-301-729.

726 MODELING

No modeling or statistical parameter interpolation techniques were used to determine any of the information presented to fulfill the regulations of this chapter. Only data from actual observations, and laboratory testing is presented as baseline information here.

727 ALTERNATIVE WATER SOURCE INFORMATION

The proposed refuse excavating operations will not have an effect on the current water quantity and quality downstream of the permit area. Because of this, no alternate water sources have been determined.

728 PROBABLE HYDROLOGIC CONSEQUENCES (PHC) DETERMINATION

728.100 thru 728.300 Determination of PHC

A description of probable hydrologic consequences related to the hydrologic regime and the quantity and quality of water under seasonal conditions is presented within this section. The PHC determination is established from baseline information presented in this chapter, and in Chapter Six (Geology).

728.310 Impacts to the Hydrologic Balance

The hydrologic conditions in terms of water quality could be affected by two types of activities: application of water for fugitive dust control and evaporation from sediment ponds and/or slurry cells within the Sunnyside Cogeneration Permit Area. The fugitive dust control will consume certain amount of water through spraying water on the proposed roads. The sediment ponds and/or slurry cells will increase water evaporation losses.

There are approximately 1.2 miles of roads to be sprayed to control fugitive dust (including upper and lower Haul Road and the Coal Access Road) within the permit area. From April through October, three trips for spraying are needed per day on average. From November through March, two trips per month are needed. This gives a total of 649 trips per year. To assume that the average road width is 30 feet and an 1/8-inch water depth per trip is needed, a total of ((649x1.2x5280x30x0.125)/(12x43560)) = 29.5 acre-feet of water is needed for fugitive dust control per year. This amount of water will be totally evaporated. Adequate underground water rights from the Dragerton well are available to SCA to meet the needs of dust control. See Figure 7-1 which includes documentation concerning SCA's water right to the East Carbon / Dragerton Well.

There are eleven sediment ponds and/or slurry cells within the permit area (as shown in Plates 7-1 and 7-6). Except for the East Slurry Cell and the West Slurry Cell, each pond has an outlet structure. The outflow from each pond will eventually be discharged to Icelander Creek. There are no outlet structures for either the East Slurry Cell or the West Slurry Cell. The East Slurry Cell receives water from the slurry ditch. The West Slurry Cell receives water from precipitation on the cell itself. Water in both cells will eventually evaporate to the atmosphere or infiltrate through the slurry deposited within the cells. The infiltrated water may eventually drain to the Icelander Creek.

Conservatively estimated, there is total water surface area of 8 acres for the nine ponds. It is assumed that there is one storm which is equivalent or greater than 10-year 24-hour storm each year, and that the dewatering time for each pond is five days (0.167 month). Also it is assumed that the storms will occur from April to September when evaporation is higher. From the Utah Weather Guide (Brough, et al, 1983), Price Station (#7026), there is an average monthly pan evaporation rate of eight inches. Assume a pan evaporation correction factor of 0.7, there is total annual evaporation loss of (8x8x0.7x0.167/12) = 0.6 acre-feet.

The total water surface area for the East Slurry Cell and the West Slurry Cell is approximately 43 acres. If a full cell needs 15 days (0.5 month) to infiltrate to empty, conservatively estimated, the evaporation loss will be (43x8x0.7x0.5/12) = 10.0 acre-feet.

The total water loss from fugitive dust control and pond evaporation is 40.1 acre-feet per year. Thus, the proposed operations will slightly affect the existing stream hydrological conditions in terms of water volume.

The Clear Water Pond acts to deposit sediments from the slurry water after it has been treated in Slurry Ponds One and Two. The Clear Water Pond discharge is labeled as station 004 for the Utah Pollutant Discharge Elimination System (UPDES) permit limitations discussed in section 731.220. The discharge from the Clear Water Pond has thus far generally met the effluent requirements of its UPDES permit, No. UT0024759, found in Appendix 7-1. The permit covers the sedimentation ponds in the SCA Permit Area. The proposed operations of SCA should not negatively affect the quality or quantity of the current discharge situation.

COARSE REFUSE SEEP

The water emerging from the base of the coarse refuse pile is believed to have had two possible sources. One source could be water trapped in the alluvium under Grassy Trail Creek could be flowing over the Mancos Shale contact and through faults, cracks, joints or other pipes to emerge under the refuse pile. The other source could be water from the east slurry cell infiltrating through fill material to the toe of the coarse refuse pile. Historic water quality data for this seep is presented in Appendix 7-6. Further water monitoring was conducted in 1994 and 1995 to determine where this water comes from. The parameters and frequency of testing were coordinated with the Department of Water Quality. Additional information concerning this seep can be found in Chapter Nine.

Three v-notch weirs have been installed in the coarse refuse seep drainage as shown on Plate 7-1C. The weirs were installed in locations that are already disturbed. These areas will be reclaimed by removing the weirs and reseeding in accordance with the reclamation plan. The weirs were installed by excavating a small trench (either with a small rubber-tire back hoe or digging by hand) and back filling around the weir. Sediment was controlled during construction by installing two rows of straw bales downstream from the second and third weirs (see Plate 7-1C). These straw bales will be left in place to deteriorate over time. They will not be replaced. Rip rap was placed below the notch on the downstream side of the weirs to control erosion throughout the useful life of the weirs. The weirs will be kept clear of sediment buildup and otherwise maintained by SCA authorized personal to provide accurate flow readings.

If water is coming from the slurry pond, the use of the East Slurry Cell as a slurry dewatering pond may be discontinued or a new discharge point may be permitted through the Utah Pollution Discharge Elimination System (UPDES). A sediment pond may be designed and constructed if the use of the East Slurry Cell is continued. Polymer flocculents may be used to aid in settlement of solids.

Monitoring of the seep at the toe of the Coarse Refuse Pile indicates levels of TDS which are higher than 4,000 mg/l. These levels of TDS are believed to be naturally occurring since the TDS level is not significantly decreased by the substantial dilution of additional springs thousands of feet downstream.

This seep or spring is believed to have existed before the Sunnyside Coal Mine operations begin disposing of the waste coal material in this canyon area several decades ago. If there has been a negative impact from the refuse to the water quality of this spring, it would have been caused by the placement of material in the canyon. The operation of Sunnyside Cogeneration Associates to remove coal refuse from the canyon is expected to have a net positive improvement to the water quality.

Analysis of water monitoring conducted between 1993 and 1995 is included in Appendix 7-4. Water monitoring will be done based on the above probable hydrologic impacts analyses in terms of both water quantity and quality. The monitoring program which will be followed throughout the life of the mine and until bond release is described in Appendix 7-8.

BTCA AREA

The additional BTCA area north of the Clear Water Pond, discussed in Section 724.200, will have total runoff of .036 acre-feet from a 10-year, 24 hour storm. Watershed data for this area is included as Appendix 7-7. The vegetative cover protects the area from wind and water erosion, thus, no additional sediment and/or erosion control methods will be implemented. Due to the topography of the area, the runoff does not concentrate to a single outlet point. It flows overland across a 200-foot section of the permit boundary. This means that over the 10-year, 24-hour storm period, the peak flow is 0.0024 cfs per linear foot of boundary. The surface elevation of this area is below existing drainage controls and is on the permit boundary on two sides. There is no future use planned for the area.

728.320 Acid or Toxic Forming Materials

A discussion of the material properties of the refuse found in the SCA Permit Area related to acid or toxic forming substances is found in section R645-301-624.220. The discussion refers to studies and analyses performed specifically to determine the effectiveness of the refuse as a power plant fuel

A Special Coarse Refuse Use Study Report prepared by John S. Huefner in February 1981 (Appendix 7-5) took samples of the coarse refuse and raw coal to verify the refuse to be non-toxic and non-acidic. The chemical testing was done by American Chemical and Research Lab in Provo and by Ford Chemical Lab in Salt Lake City. Only one sample of refuse tested by Ford Chemical showed the manganese to be three times above the allowable limit, however, this does not show-up in other samples. This report, however, omits analysis of the Acid-Base Potential of Selenium and Boron.

Additional studies of the material properties of the refuse piles will be ongoing through the duration of the project. See Appendix 6-5 for a proposed sampling plan. If acid or toxic forming substances are encountered in future testing, a report of the concentration and volume of the material will be prepared for DOGM. This report will include a plan, for appropriate disposal of the material, which would protect the water resources in the area.

728.330 thru 340 Impacts From Mining and Reclamation

Existing or projected impacts to the hydrologic regime from mining and reclamation activities are discussed within section 728.100 and in more detail throughout other sections. Information related to runoff conveyance and sediment control is included in sections 732 and 733. Information related to general hydrology, water quality monitoring, and channel reclamation can be found in Sections 722, 724, and 760 respectively.

728.400 Permit Revisions

This Permit Application is not a request for a permit revision. The SCA Permit Area was formerly under the control of the SCC, and used as a disposal area for refuse from the Sunnyside mines. The SCA Permit Area is now controlled by SCA, and will be used by SCC as a disposal area for coal mine waste.

729 CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

729.100 thru 200 Cumulative Hydrologic Assessment by DOGM

As stated in R645-729.100 and 729.200, DOGM will provide a Cumulative Hydrologic Impact Assessment.

730 OPERATION PLAN

731 GENERAL REQUIREMENTS

General requirements given under this section are discussed specifically in the following sections: 731.100 Hydrologic-Balance Protection, 731.200 Water Monitoring, 731.300 Acid and Toxic Forming Materials, 731.400 Transfer of Wells, 731.600 Stream Buffer Zones.

731.100 thru 731.122 Hydrologic Balance Protection

Section 728.310 has discussed how the operations proposed will not affect the existing pre-operational hydrologic balance. For groundwater, this assessment is based on the lack of encountering much groundwater in drilling

records for the SCA Permit Area.

The excavation of the refuse pile will not affect any of the sedimentation ponds within the SCA Permit Area. The excavated areas will likely yield somewhat higher amounts of sediment but this will easily be treated in the sedimentation ponds. Sediment Control is discussed in detail in section 732.

731.200 WATER MONITORING

A water monitoring schedule was developed based on the PHC determination. This monitoring will be performed to characterize all the water within and adjacent to the permit area. This includes all the UPDES discharge sites, all surface water streams, all ground water sources, and the seep at the toe of the refuse pile.

The Operational water monitoring is based on Technical Directive 004 dated May 23, 1995. The Surface and Groundwater Monitoring Locations shown on Plate 7-2 and listed in Appendix 7-8 on Table 7-2A will be monitored according to the Operational Parameters listed in Table 7-2C throughout mining until two years after surface reclamation activities have ceased. The sites will then be monitored according to the Post Mining Requirements proposed by SCA in Table 7-2D until termination of bonding.

Appendix 7-8 also summarizes the monitoring requirements from the UPDES permit which apply to the sediment ponds within the permit area. Plate 7-3 shows the locations of the UPDES water monitoring sites.

Weirs may be placed as needed to measure flows on the permit site. These may be installed as either temporary or permanent structures. (See Plate 7-19)

731.210 thru 731.215 Groundwater Monitoring

Groundwater monitoring will be performed based on the existing East Carbon / Dragerton well. The parameters and monitoring schedule will be performed based on the requirements listed in Table 3 and Table 4 included in the Guidelines. Two years of baseline data collection was performed

731.220 Surface Water Monitoring

Each of the UPDES discharge locations as well as the seep at the toe of the refuse pile and the seep at the property boundary will be sampled in accordance with Guidelines and the UPDES Permit.

731.221 thru 731.222 Surface Water Monitoring Plan

The surface water monitoring plan will be based on the PHC determination of section 728. The only determined hydrologic consequence is possible increased sedimentation in the excavated areas. This will generally be controlled by the sedimentation ponds. The monitoring plan will include sampling and testing of the sedimentation pond water as they discharge. The Clear Water Pond discharges continually only when the Sunnyside Wash Plant is in operation and delivering coal fine slurry to the SCA Permit Area. The other ponds may have intermittent discharges. As discussed in section 732, this is because they were designed for a capacity equal to a 10 year 24 hour storm event runoff. These ponds will be monitored once a month for water quality parameters as shown in the UPDES permit No UT0024759 found in Appendix 7-1. Flow rate and TSS will be monitored twice a month as set forth in the permit.

Monitoring for Acute Toxicity

Pursuant to the UPDES permit requirements, beginning July 1, 1992 the permittee will conduct quarterly acute static replacement toxicity tests on composite samples from station 004.

Impacts on Icelander Creek

Impacts on Icelander Creek will be monitored by performing field tests at the ICE-1 (Icelander Creek) and the F-2 (spring) sites once a month. Field measurements include: flow rate, pH, temperature, conductivity, and dissolved oxygen. These sites will be sampled quarterly for water quality parameters. If the water is cloudy, or if the conductivity is abnormally high, samples will be taken during the field testing visits to these sites and tested for Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) concentrations.

731.223 Surface Monitoring Data Submittal Requirements

The surface monitoring data will be submitted to DOGM every three months for each monitoring location. Monitoring submittal will include analytical results from each sample taken during the approved reporting period. Sunnyside Cogeneration takes responsibility for complying with all regulations set forth by DOGM and meeting the UPDES discharge authorization limitations shown in the UPDES Permit (Appendix 7-1).

The monitoring data will be supplied to the Utah Division of Water Quality monthly as required by the UPDES permit. Results of the water quality monitoring will also be filed on the project site.

731.224 thru 731.224.2 Surface Water Monitoring Requirements

Surface water monitoring will continue, as described in Appendix 7-8, through the end of the operations of the Sunnyside mine preparation plant (end of necessary slurry and coarse refuse disposal), and through the reclamation process until the bond release. The baseline monitoring points identified in Appendix 7-8 will be analyzed as indicated in Appendix 7-8, Table 7-2B for a period of two years. Then the points will be monitored as operational sites according to a list of parameters to be negotiated between DWQ, DOGM and SCA following collection and analysis of baseline data. The monitoring plan will always be arranged to meet the requirements of DOGM, and of the Division of Water Quality via the UPDES permits.

The monitoring will be conducted to attempt to minimize disturbance to the hydrologic balance, and to achieve the goals of the approved monitoring plan.

731.225 Surface Water Monitoring Equipment and Structures

Equipment, structures and other devices utilized in conjunction with the surface water monitoring program will be properly installed, maintained and operated. The equipment and structures will be removed when no longer needed.

731.300 thru 731.320 ACID AND TOXIC FORMING MATERIALS

Acid and toxic forming potentials are appropriately discussed in section R645-624.220 and 628-320.

731.400 Transfer of Wells

Exploration wells or monitoring wells will only be transferred after approval by DOGM and in accordance with the Utah State water laws and regulations. Approval of well transfer will also be required from the State Engineer. There are no wells currently on the SCA Permit Area. There has been significant drilling exploration of the SCA Permit Area. These drill holes will be sealed in a manner appropriate for the environment and for the proposed excavation activities. Figure 7-1 includes documentation concerning SCA's water right to the Dragerton Well. A permit to install a monitor well at the toe of the refuse pile has been requested from the State Engineer in accordance with the exploratory drilling program detailed in Appendix 6-5.

731.500 thru 731.522 Discharges into and out of Underground Mines

The proposed operations of this Permit Application consist only of excavation of coal mine waste and refuse piles. Therefore this section does not apply.

731.600 thru 731.620 Stream Buffer Zones

All disturbance caused by the proposed operations will be well over 100 feet from any natural stream. Therefore this requirement does not apply.

731.700 Cross Section and Maps

731.710 Water Supply Intakes and Waters Receiving Discharge

All discharges from the SCA Permit Area flow into tributaries of Icelander Creek. This is shown in Plates 7-3 and 7-6. Icelander Creek is not currently used as a culinary or irrigation supply.

731.720 Map Showing Diversions, Conveyance and Treatment Facilities

This requirement does not apply because Icelander Creek is not currently being used for culinary, irrigation, or industrial uses.

731.730 Locations of Monitoring Stations

The locations of the monitoring stations used to gather baseline information on water quality and quantity are shown in Plate 7-2. The locations of UPDES discharge monitoring sites are shown separately on Plate 7-3. These locations are identified in the field with metal posts and labels.

731.740 Map Showing the Locations of Sediment Ponds

The locations of the seven sedimentation ponds and the four slurry ponds are discussed in section 733 are shown in Plate 7-1. Plate 5-6 also shows the location of the refuse pile.

731.750 Cross Sections for Each Sediment Pond and Other Impoundments

See Section 732.

731.800 Water Rights

The majority of the rights in the area are held by the municipalities, SCC and SCA. The rights mostly relate to Grassy Trail Creek and discharges from the Whitmore Canyon Dam. The operations taking place on the SCA Permit Area do not affect any currently held water right.

732 SEDIMENT CONTROL MEASURES

732.100 Siltation Structures

The existing siltation structures which are a part of the refuse disposal, and proposed refuse excavation activities will be maintained to comply with the requirements of this regulation. Siltation structures that impound water are considered herein as treatment facilities and sedimentation ponds. A discussion of these facilities is set forth in Section 732. Siltation fences may be placed as needed to improve erosion control.

732.200 Sedimentation Ponds

732.210 Compliance Requirements

There are eleven impounding structures in the SCA Permit Area which are all shown on Plate 7-1. Out of the eleven impounding structures, seven are sedimentation ponds serving the disturbed portions of the SCA Permit Area. Each sedimentation pond is governed by an UPDES permit which controls water quality discharges. Operational requirements of the seven sedimentation ponds located in the SCA Permit Area as outlined by this regulation will be met. Detail designs related to the facilities are given in Appendix 7-3.

Below is an outline of various design parameters for the sediment ponds found within the SCA Permit Area.

Pond Description	Reference Plate	Maximum Depth (ft)	Volume (acre-ft)
Coarse Refuse Toe	7-7	9.5	1.6
Rail Cut	7-8	8	4.8
Pasture	7-9	7.5	1.0
Old Coarse Refuse Road	7-10	6.0	0.9
Slurry Pond 1	7-4	10	16.4
Slurry Pond 2	7-4	9	15.3
Clear Water Pond	7-4	8	4.9
Borrow Area Pond	7-11	9.5	8.3
Coal Pile Sediment Pond	7-18	7	1.5

Topsoil stockpile sediment will be controlled by construction of a berm around the perimeter of each stockpile. Detailed calculations for each berm are found in Appendix 7-7.

732.220 MSHA Requirements

The seven sedimentation ponds within the SCA Permit Area comply with the MSHA requirements given under R645-301-513.100 and 513.200. The BTCA area north of the Clear Water Pond does not meet the criteria of MSHA 30 CFR regulations, thus no additional calculations have been made concerning MSHA regulations.

732.300 Diversions

An extensive network of runoff collector ditches has been constructed within the permit area. A layout of these facilities is shown on Plate 7-6. Individual diversion dimensions can be found in Appendix 7-3. The ditches will be maintained to comply with the requirements of this regulation.

The runoff from the BTCA area, located north of the Clear Water Pond, does not enter a sediment pond or runoff ditch. The area is well-vegetated and the runoff will be dissipated naturally through existing vegetation as well as through straw bales placed along the Permit boundary. A berm at the toe of the topsoil pile controls the erosion of this resource. The site is approximately 1.0 acres and is referenced on Plate 7-1. See also Appendix 7-7 for more information.

A natural watershed (67 acres undisturbed) adjacent to the Permit Area, drains to two 24-inch culverts under a road approximately 150-feet southeast of the Old Coarse Refuse Road Pond. These two culverts are more than adequate to safely pass the peak storm flows as shown in Appendix 7-3.

A natural watershed (15 acres undisturbed) adjacent to the Permit Area, drains to the channel where the coarse refuse seep flows. This flows through a 36-inch CMP under the railroad. The culvert is more than adequate to safely pass the peak storm flows as shown in Appendix 7-3. A v-notch weir has been installed on the upstream end of this culvert to measure flow.

732.400 Road Drainage

All roads will be constructed, maintained and reconstructed to comply with section 742.400

732.410 Alteration and Relocation of Natural Drainageways

No alterations to existing natural drainageways are planned for the operations in the SCA Permit Area.

732.420 Inlet Protection

Measures to be taken to protect the inlet end of ditch relief culverts (when required) within the SCA Permit Area may include revegetation, installation of riprap, or a drop box inlet. Flows applicable to runoff control ditches are generally small and inlet protection is not required to protect against erosion. If it is found that significant erosion does occur at the inlet to a ditch culvert, the items listed above will be implemented as appropriate. Details for inlet and outlet protection are given in Chapter Five.

733 IMPOUNDMENTS

There are no additional impoundments proposed for the SCA Permit Area. If the need for an additional impoundment is observed, it will be designed and certified according to the requirements of these regulations, and

the other regulations within the State of Utah Coal Mining Rules. The plans and certification will then be submitted to DOGM for approval.

734 DISCHARGE STRUCTURES

See Section 744.

735 DISPOSAL OF EXCESS SPOIL

See Chapter Nine, Sections 9.6 through 9.7 and Appendices 9-2 and 9-5..

736 DISPOSAL OF COAL MINE WASTE

See Chapter Nine, Sections 9.6 through 9.7 and Appendices 9-2 and 9-5..

737 NONCOAL MINE WASTE

Non-coal mine waste will be disposed of as discussed further in Chapter Nine, Section 9.6.

738 CASING AND SEALING OF WELLS

For reasons previously discussed, there are no groundwater monitoring wells which need casing and sealing during the operations or reclamation activities.

740 DESIGN CRITERIA AND PLANS

741 GENERAL REQUIREMENTS

Site specific plans used for the design and control of surface drainage are discussed in the following sections.

742 SEDIMENT CONTROL MEASURES

See Section 732 for detailed designs of all sediment control structures. The major runoff and sediment control measures in the SCA Permit Area include numerous diversion ditches and several impoundments. Some siltation fences and straw bales are in-place and maintained to reduce the contribution of sediment to receiving streams from areas which do not report to an approved impoundment. If additional siltation structures are required, SCA will request approval from the Division prior to installation.

742.220 Sedimentation Ponds

Inspection

All sedimentation ponds will be inspected a minimum of four (4) times per year for structural weakness, erosion, proper function, sediment levels and other hazardous conditions. A written record of findings will be maintained at the SCA cogeneration facility for inspection. Reports of adverse embankment conditions including erosion, structural weakness or other hazardous conditions will be submitted to DOGM within thirty (30) days of the inspection. Hazardous conditions will be reported directly to DOGM immediately after the finding. See the inspection schedule prepared in compliance with R645-301-514.

Sediment Disposal

Sediments removed from the ponds will be disposed in the Excess Spoil Pile (Plate 9-1), or used as a borrow material. If the material is to be used as a borrow material, the material will be tested. SCA will contact DOGM to receive approval of the location and the amount of material to be used.

MSHA REQUIREMENTS

The East Slurry Cell is used as needed to allow the cleaning of Slurry Ponds One and Two. The East Slurry Cell meets or exceeds the size criteria of 30 CFR 77-216(a) of the Mine Safety and Health Administration and has an MSHA ID number 1211-UT-09-01813-01. The impoundments will comply with the requirements of this regulation The MSHA Approved Program for Impoundment Inspections is in Appendix 5-8.

742.230 thru 742.240 Other Treatment Facilities

Sediment from most of the disturbed area within the Permit is controlled by the collector ditches and sedimentation ponds.

Topsoil stockpiles have been revegetated to decrease the erosion potential. Berms were constructed around the perimeter of each topsoil pile to contain sediments during storm runoff events. The calculations used to design the minimum height of a berm are found in Appendix 7-7. These small berms are considered to be alternate sediment control measures, not impoundments.

Siltation fences and straw bales are used to reduce the contribution of sediment to the receiving streams. These have been installed and are maintained in accordance with the performance standards outlined in Chapter 5.

The following silt fences, straw bales, or surface treatments are in-place either primary or secondary sediment control:

Siltation Fences	Location
15 L.F. installed prior to SCA	Across a minor accessway leading to the weir in the northwest area of the Permit Site. Approximately 60 feet southeast of 36-inch CMP under railroad tracks.
30 L.F. installed prior to SCA	Below the outlet of the Coarse Refuse Toe Pond.
40 L.F. installed 1993	Outer southwest bank of the Coarse Refuse Toe Pond.
2100 L.F. installed 1994	In the drainages along the toe of the area reclaimed in connection with the final reclamation of the Old Coarse Refuse Road. Silt fences below areas treated with erosion matting will not be maintained. These will be removed when field conditions indicate that they are no longer of significant value.
6 L.F. installed 1995	At the permit boundary crossing the outlet ditch from the Pasture Pond and Coal Pile Sediment Pond
10 L.F. installed 1995	In front of the inlet to the above ground culvert OCRR-C1 which flows to the Old Coarse Refuse Road Sediment Pond

Straw Bales	Location
30 L.F. installed in 1989	Along the Permit boundary northwest of the Clear Water Pond.
15 L.F. installed in 1994	Seep Flow. 2 bales at the Permit boundary, 3 bales below culvert. These are left to deteriorate - not to be removed or replaced.

Surface Treatments	Location
Surface Roughening - 1994 Five acres +/-	In connection with the final reclamation of the Old Coarse Refuse Road, the surface was roughened by digging small holes or indentions. This is expected to help control sediment by reducing surface runoff while the vegetation is established.

12,000 S.Y. Straw Matting installed in 1994.	In connection with the final reclamation of the Old Coarse Refuse Road, slopes steeper than 2:1 were treated with straw matting. As the matting degrades, vegetation is expected to increase.

742.300 Diversions

742.310 thru 742.311 General Requirements

All diversions located within the SCA Permit Area, which are shown in Plate 7-6, have been designed to minimize adverse impacts to the hydrologic balance of the permit and adjacent areas, to prevent material damage outside the SCA Permit Area and to assure the safety of the public. No diversions have been designed or are planned to divert water into underground mines. Any underground mining is significantly upstream from the SCA Permit Area.

742.312 thru 742.333 Diversion Design

See Section 732.

742.400 thru 742.423.5 Road Drainage

The roads in the SCA Permit Area are used primarily for refuse hauling and area maintenance. The road drainage control system utilized at the SCA Permit Area was discussed earlier in section 732. The collector ditches for this purpose are shown on Plate 7-6. The drainage system has been designed to safely convey surface runoff away from road surfaces through a network of collector ditches and culverts. The system has been designed to collect all runoff waters thereby protecting downstream water quality and reducing potential for flooding. The fact that the road system does not cross local stream channels helps protect downstream water quality.

Ditches have been designed according to methodology discussed previously. The design is to safely pass a 10-year, 6-hour storm as required for miscellaneous flows. Culvert sizes have been selected to ensure design capacity and structural integrity. The capacity of the road drainage system will be maintained. If the system is ever damaged reducing capacity of a ditch or culvert, repairs will be implemented immediately.

743 IMPOUNDMENTS

See Section 732.

744 DISCHARGE STRUCTURES

Discharge from sedimentation ponds and impoundments is controlled by riprap channels and other devices where necessary to reduce erosion to prevent deepening or enlargement of stream channels, and to minimize disturbance of the hydrologic balance. Detailed designs of the spillways from each pond are provided in Appendix 7-3. Cross-sections are provided on the plate corresponding to each pond.

745 DISPOSAL OF EXCESS SPOIL

See Section 735.

746 COAL MINE WASTE

746.110 thru 746-430 Waste Disposal Plans

The slurry ponds and refuse pile are shown on Plate 7-1. Details for the slurry ponds are shown in Plate 7-4, 7-12, 7-16 and 7-17.

Slurry Ponds

Fine refuse from the preparation plant is moved to dewatering or disposal areas by slurry transport in an open ditch. There are four slurry ponds that lie within the SCA Permit Area: the West Slurry Cell, the East Slurry Cell, Slurry Pond One, and Slurry Pond Two. The East and West Slurry Cells are settling and evaporating impoundments that were constructed prior to or during 1974. Slurry Ponds One and Two are settling ponds. Presently, Slurry Pond One and Slurry Pond Two are actively used, while the East Slurry Cell is used as an overflow for Slurry Ponds One and Two when they are not in service. The West Slurry Cell is used as a disposal area for dried slurry from Slurry Ponds One and Two.

The West Slurry Cell was the first impoundment to be constructed for the disposal of slurry and coal mine waste in the late fifties to early seventies. Coal mine waste and other waste was used as fill material to block a wash in the pediment material at the mouth of Whitmore Canyon overlooking the Icelander Drainage. Slurry from the preparation plant was transported to the impoundment by ditch for disposal. As the level of the slurry increased, additional coal mine waste was added to the top and sides of the impoundment. The present level of the slurry in the impoundment is over 200 feet above the bottom of the wash. Currently, the impoundment is used as a disposal area for dried slurry material from Slurry Ponds One and Two. Trucks end-dump the slurry material onto the northwest side of the cell from the top of the dike. A large dozer then spreads and compacts the material.

Construction of the East Slurry Cell on the east side of the West Slurry Cell was in 1974. Coal mine waste was placed and compacted in dikes. After the dikes were completed and covered with soil material, the impoundment was filled with slurry. Disposal of slurry continued until 1983. Presently, the impoundment is used as an overflow for Slurry Ponds One and Two.

Slurry Ponds One and Two were constructed in 1978 to the north of the East and West Slurry Cells. These ponds were constructed by excavating a depression in the colluvium at a gentle slope. Material from the depression was spread out down slope of the ponds for approximately 50 to 100 feet. Slurry Ponds One and Two are used in rotation. Slurry is introduced into a pond where it settles and is then filtered (Plate 7-4). During the use of the first pond, the second pond is decanted and the dried slurry removed by truck to the West Slurry Cell. After the second pond is cleaned, the cycle is reversed. If both ponds are in the drying and cleaning cycle, the slurry will be diverted to the East Slurry Cell. Water from Slurry Ponds One and Two is filtered and discharged from the Clear Water Pond into Icelander Drainage (Outfall 004 in the UPDES Permit).

Design and construction of the slurry ponds was conducted pre-law, consequently, some design standards were not met. A geotechnical evaluation, certification of the alternate methods of construction and current static and seismic safety factors was conducted to determine compliance. Results of the evaluations are found

in Appendix 5-3 and 5-4. It was found that the impoundment dikes constructed of coal mine waste are stable with the exception of the west dike of the West Slurry Cell The refuse pile has been specifically constructed since that time to stabilize the dike wall to meet MSHA requirements.

All surface drainage from the areas above the slurry ponds is diverted away from the embankments by diversion ditches designed to carry the peak runoff from 100-year, 6-hour precipitation event. The diversion structures will be maintained to prevent blockage.

Visual inspections by a qualified registered professional engineer or a qualified MSHA impoundment inspector will be conducted according to 30 CFR 77.216-3 to assess the stability of the impoundments and determine the amount of seepage, if any. If the inspection discloses that potential hazards exists, DOGM will be informed promptly of the findings, emergency procedures formulated for public protection, and remedial action measures will be implemented.

Maintenance of the embankments will consist of filling and grading any erosion or other failure features discovered by the above inspections.

Subsidence will not affect the pond and embankments since the structures do not overlie the coal seam and are located several miles west of the nearest outcrop. Mudflows, rock debris falls or other landslides are not expected to be a problem because the embankments are located at or above the level of the surrounding topography. Possibility of failure downhill of the embankments is limited to a thin layer of colluvial material on bedrock. Failure of this material would not threaten the embankments.

Coarse Refuse Pile

The outer slope of the refuse pile is maintained at a 27° slope. At 50 feet vertical increments, a 20-foot wide terrace is constructed for water runoff and erosion control. Construction of the refuse pile was started before the 1977 enactment of the current regulations. As a result, the sub-drainage system required by current regulations was not incorporated in the design; however, a 24-inch perforated culvert was placed in the drainage bottom to collect groundwater seepage.

All surface water drainage from the area above the waste bank and from the crest and face of the final structure will be diverted away from the fill into stabilized diversion channels designed to pass safely the runoff from a 100-year, 6-hour precipitation event. A plan view of the diversion ditches is found in Plate 7-6.

747 DISPOSAL OF NON-COAL MINE WASTE

See Chapter Nine, Sections 9.6 and 9.7.

748 WELL CASING AND SEALING

Groundwater monitoring wells that may be utilized within the SCA Permit Area will be drilled and installed by a driller licensed in the State of Utah. Procedures and materials used to drill and install the groundwater monitoring wells will be in accordance with the State of Utah Administrative Rules and Water Well Drillers (July 15, 1987) Appendix I, Monitor Well Installation Guidelines. Abandonment and sealing of groundwater

monitoring wells will also be in accordance with Rule 12 of the Utah rules. Currently there are no groundwater monitoring or supply wells in the SCA Permit Area. There are some piezometer tubes near some of the impoundments.

Exploration boreholes that are drilled on or within the refuse pile for the purposes of determining the thickness of the coal mine waste, or the suitability of the coal mine waste for use in the cogeneration plant, will not be sealed through the interval within the refuse pile. However, intervals of native soil or bedrock that are penetrated by exploration boreholes will be sealed with bentonite or other suitable grout in accordance with Utah Administrative Rules for Water Well Drillers (July 15, 1987), Rule 12.

750 PERFORMANCE STANDARDS

751 WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS

Discharges of water from the disturbed areas, via the collector ditches and sedimentation ponds will continue to be made to comply with all Utah and federal quality laws and regulation. Effluent will be according to 40 CFR Part 434.

752 SEDIMENTATION CONTROL MEASURES

Sedimentation control measures will be maintained, reclaimed and constructed if needed and approved, according to R645-301-732, 742, and 763. Additional details can be found in each respective section referenced.

Existing, and new roads (if needed) will be located, designed, constructed, reconstructed, used, maintained, and reclaimed according to R645-301-732.400, R645-301-742.400, and R645-301-762 to achieve the following objectives:

1. The control or prevention of erosion, siltation and air pollution. This is obtained through the revegetating or stabilizing of all exposed surfaces subject to increased erosion

2 The control or prevention of addition contributions of suspended solids to stream flow or runoff outside the permit area.

3. Prevent the violation of effluent standards given under section 751.

4. Minimize the diminution to or degradation of the quality or quantity of surface and ground water systems.

5. Refrain from significantly altering the normal flow or water in streambeds, or drainage channels.

A proposed road which meets all of the previously mentioned requirements is discussed in Chapter Five.

753 IMPOUNDMENTS AND DISCHARGE STRUCTURES

Sections 732 through 734 discuss the locations of discharge structures and impoundments, and how they will be maintained, and reclaimed.

754 EXCESS SPOIL, COAL MINE WASTE, AND NON-COAL MINE WASTE

See Chapter Nine and Chapter Ten.

755 CASING AND SEALING OF WELLS

As has been previously discussed there are no wells to case and secure in the SCA Permit Area.

760 RECLAMATION

761 GENERAL REQUIREMENTS

See Chapter Nine, Mine Plan for details on contemporaneous reclamation. See Chapter Ten, Reclamation Plan for details on final reclamation.

765 PERMANENT CASING AND SEALING OF WELLS

Any type of existing drill hole will be appropriately cased and sealed, or back filled during the reclamation process.

APPENDIX 7-4
BASELINE WATER QUALITY DATA

APPENDIX 7-4 BASELINE WATER QUALITY DATA

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WATER QUALITY CHARACTERIZATION - STIFF DIAGRAMS

DATA ATTACHMENTS

INTRODUCTION

For decades the Sunnyside Coal Mine (SCC) has used the area now located within the SCA Permit Boundary as a refuse disposal site. Coarse refuse and slurry have been transported to and placed in and around the West and East Slurry Cells and Slurry Ponds #1 and #2. In January 1994, SCC significantly scaled back production and within a few months ceased operations. The slurry water had long been suspected as being a major contributor to the source of the Coarse Refuse Seep.

Although weirs were not installed to measure flows at the seep until April 1994, there has been a significant reduction of flow measured at the three weirs. Exploratory drilling conducted by SCA on the refuse pile in August 1995 revealed relatively dry conditions throughout and under the refuse pile. These conditions appear to indicate that the water which continues to flow at the CRS, CRC, and CRB are related to a source of groundwater not associated with the slurry dewatering which previously occurred in the East Slurry Cell.

DATA

The Surface and Groundwater Monitoring Locations for the Sunnyside Cogeneration Facility DOGM Permit Water Quality Monitoring Plan which are shown on Plate 7-2 and listed in Appendix 7-8 on Table 7-2A were monitored for two years (June 1993-1995) according to the Baseline parameters listed in Table 7-2B. This appendix consists of a summary and interpretation of the Baseline water quality monitoring data collected.

The monthly field-parameter data collected by Huntingdon during the monitoring period is presented in Table 3. Huntingdon collected quarterly water quality samples which were then sent to the Utah certified Huntingdon laboratory in Billings, Montana. The analytical laboratory results of the water samples taken by Huntingdon are summarized in Table 4.

A copy of the analytical data and the chain of custody documentation is included as Attachment A. A copy of the field data sheets documenting Huntingdon's field parameters is included as Attachment B.

In addition to the Baseline monitoring, Eckhoff, Watson and Preator Engineering (EWP) began a special study of the flows from the Coarse Refuse Seep. Events of the study were coordinated with the Division of Water Quality (DWQ) and DOGM. Three weirs were installed in April 1994 at the "Source" (CRS), Railroad Culvert (CRC), and the Permit Boundary (CRB). The values of flow before this time period were visually estimated by Huntingdon. EWP measured field parameters weekly and took water samples monthly.

The field parameter data collected by EWP is located in Table 1 Laboratory testing on the samples collected by EWP was performed by Mountain States Analytical. The laboratory results are summarized in Table 2. A copy of the analytical data and the chain of custody documentation is included as Attachment C. A copy of the field data sheets is included in Attachment D.

Statistical analysis of the data collected by Huntingdon and EWP is itemized in Table 5. The statistical parameters include minimum, average, maximum, standard deviation, and number of samples available.

INTERPRETATION OF DATA

At the time of report preparation, the data collected from 1993, 1994, and through mid summer of 1995 was available. The trends of the water quality for all locations in 1994 tend to be similar to the water quality of 1993 as well as 1995. This report compares the available parameters of water quality at each of the locations over time. The following evaluations of the Baseline monitoring data were made during this report:

- Different water chemistry types of each location;
- Changes in water chemistry over time for each location;
- A comparison of specific conductivity, dissolved oxygen, total dissolved solids and temperature over time for each location.

Additional evaluations are included using data from the special study of the Coarse Refuse Seep conducted by EWP.

Field data

The field parameter data as well as the laboratory results contain significant trends in the different types of water parameters. Figures 1 through 15 are line graphs which compare the flow, temperature, specific conductivity, dissolved oxygen and total dissolved solids of each of the sites. The following observations can be made from the graphs:

- The decreased flows and temperature and the increased pH at the Coarse Refuse Seep Monitoring sites indicate that previously alledged flows through the refuse pile from slurry dewatering in the East Slurry Cell have either ceased or have been substantially reduced to a neglegible amount.
- The temperature measured at the CRS is consistently higher than at the other monitoring sites. The temperature at the CRS, CRC and CRB steadily decreased until December 1994 and has been relatively stable through July 1995.

- The Specific Conductivity of the CRS, CRC and CRB is much higher than the other monitoring sites,

- The dissolved oxygen (DO) of the CRS is significantly lower than at the other monitoring sites;

- The Total Dissolved Solids (TDS) of CRS, CRC and CRB samples was much higher than the other monitoring sites.

The elevated temperature which previously occurred at the CRS may be attributed to previous fires within the refuse material. Those fires are not believed to exist currently at the same extent as previously existed. Temperatures which continue to be higher at the CRS than at the CRB may simply be attributed to the warmer conditions of the groundwater. The low values of DO at the CRS may be related to low turbulence in the ground water. The elevated values of TDS for the Coarse Refuse Seep flows may be the result of water percolating through the Mancos Shale. The high readings of specific conductivity for the Coarse Refuse Seep samples reflect the large amount of dissolved solids and namely the ions present in the discharge.

The frequent monitoring of the Coarse Refuse Seep performed by EWP provided a good look at trends and fluctuations. The flows at the seep were not accurately measured prior to cessation of the operations of the Sunnyside Coal Mine (SCC). The estimates made by Huntingdon during times when SCC was sending slurry into the East Slurry Cell were commonly higher than 100 gpm. In May, after the three weirs were installed, flows were measured at the CRS at less than 13 gpm. By December, flows at the CRS had decreased to less than 3 gpm. Flow measurements at the CRC and CRB have larger fluctuations than at the CRS, and did not necessarily demonstrate decreasing trends as strongly through the runoff season in 1995. Observations into the summer of 1995 appear to show a significant flow decrease which may simply represent seasonal fluctuations.

The pH measured at the CRS, CRC, and CRB has shown a significant increase. This may be a result of elimination of the water flowing through the refuse. None of the measurements performed by EWP or Huntingdon indicated a pH at the CRS of less than 6.5.

Analytical data

To facilitate the evaluation of different water chemistry types present and the changes in water chemistry at each location over time, the major ion data for the quarterly sampling by Huntingdon and the monthly data sampling by EWP were plotted on Stiff diagrams and individual parameters were plotted as line graphs. The line graphs are included as Figures 16-30. The Stiff plots are included as Figures 31 through 43. (See the Table of Contents for this Appendix for a listing of the individual figures and titles.)

A review of the Stiff plots and the line graphs indicates two distinct groupings of water chemistry noted by the following trends.

- The stiff diagrams for the Coarse Refuse Seep monitoring sites indicate that the CRS, CRC, and CRB have similar water quality characteristics. They are rich in sulfate, magnesium, and calcium.

- The stiff diagrams for the Dragerton Well, Icelander Creek and F-2 Whitmore Spring monitoring sites indicate that they have similar water quality characteristics. They have a balanced chemistry of Sodium and Sulfate and moderate amounts of Magnesium. These stiff diagrams also indicate that Icelander Creek has not been significantly affected by the characteristics (such as higher sulfates) at the Coarse Refuse Seep.

- The Total Dissolved Solids (TDS) of CRS, CRC and CRB samples was much higher than at the Dragerton Well, Icelander Creek and F-2 Whitmore Spring.

The total Boron concentration is largely made up of dissolved boron and did not have a major decrease in concentration between the CRS and CRB even though there was a large increase in flow.

Total Iron concentrations exist mostly in particle form and clearly decrease to negligible amounts by the time they reach the permit boundary. It is most probable that this reduction of iron is due to settling. Fluctuations occurred at the CRS and a definite trend is not yet clear in Figure 20.

A significant portion of the total Manganese concentration is in the dissolved form but there is a decrease in the concentration at the CRB when compared to the CRS. This decrease is potentially caused by oxidation/reduction reactions occurring with the increased exposure to oxygen in the surface water.

ANALYTICAL VARIANCES

Two analytical differences between the work by Huntingdon and by EWP should be noted:

- The laboratory work performed on the samples taken by Huntingdon did not include analysis of Potassium

- The laboratory work performed on the samples taken by EWP did not include analysis of Chloride ion

The lack of a value for Potassium in the Huntingdon samples appears to be negligible when comparing the stiff diagrams of the Huntingdon samples to the stiff diagrams of the EWP samples.

The amount of potassium detected in the EWP samples at the Coarse Refuse Seep did not significantly alter the shape of the stiff diagrams.

The Chloride ion was not part of the study performed by EWP because it was already being monitored by Huntingdon. The stiff diagrams for the EWP samples were drawn with Cl^- at zero. The Cl^- measured by Huntingdon was typically between five and ten meq/l. A modification to the EWP stiff diagrams to infer that Cl^- had similar quantities as in the Huntingdon samples could be justified.

Also, the laboratory detection of sulfate in the samples taken by EWP at the Coarse Refuse Seep during the month of November appears to be erroneous when compared to the values for the rest of the year. The sulfate parameter plotted on the stiff diagrams for the EWP samples during the month of November seem to be inconsistent with the other months. There may have been an error in the samples or the analysis for that month.

A few other minor data points which appear to represent sampling or analytical errors were removed from the data set prior to analysis.

SUNNYSIDE COGENERATION ASSOCIATES

SURFACE WATER-BASELINE-COARSE REFUSE SEEP MONITORING performed by EWP

PARAMETER	19-May-94			27-May-94			8-Jun-94			16-Jun-94		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	8.5	29	48	12	36	52	8.5	40	48	7.1	29	40
Temperature C	25.50	15.92	15.55	25.80	17.79	16.77	24.40	16.97	15.50	26.97	19.06	19.62
pH	6.8	7.6	8.1	6.6	7.2	7.8	6.6	7.3	7.8	6.6	7.3	7.8
Spec. Cond mS	5.50	5.62	5.18	5.60	5.60	5.07	5.50	5.60	5.30	5.48	5.62	5.28
Disolved Oxygen mg/l	4.20	6.15	7.64	3.60	6.04	6.87	4.00	7.00	8.00	3.80	6.33	7.61

PARAMETER	23-Jun-94			30-Jun-94			8-Jul-94			14-Jul-94		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	7.1	29	36	7.1	32	40	7.1	32	40	7.1	32	32
Temperature C	27.92	20.37	22.75	24.32	18.10	15.90	25.61	18.80	17.60	26.01	20.30	19.75
pH	6.6	7.3	7.8	6.7	7.3	7.9	6.8	7.4	8.06	6.6	7.4	7.98
Spec. Cond mS	5.5	5.60	5.29	5.50	5.66	5.40	5.50	5.67	5.40	5.50	5.68	5.40
Disolved Oxygen mg/l	2.6	5.50	6.40	1.10	5.60	7.30	1.20	5.70	7.40	1.90	5.70	7.02

PARAMETER	21-Jul-94			29-Jul-94			4-Aug-94			11-Aug-94		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	7.1	29	26	7.1	32	48	8.5	32	36	7.1	32	48
Temperature C	26.6	21.2	22.6	25.3	19.8	17.5	25.5	20.6	18.3	25.2	19.7	18.5
pH	6.8	7.5	7.9	6.9	7.5	8.1	6.9	7.5	8.2	6.9	7.6	8.2
Spec. Cond mS	5.5	5.7	5.4	5.6	5.7	5.5	5.5	5.8	5.5	5.5	5.7	5.6
Disolved Oxygen mg/l	1.5	5.0	6.1	1.0	5.3	7.3	1.1	5.2	6.6	1.4	5.1	6.8

PARAMETER	19-Aug-94			26-Aug-94			31-Aug-94			9-Sep-94		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	7.1	32	36	7.1	32	29	5.8	32	26	5.8		48
Temperature C	24.6	19.4	17.2	23.9	19.5	16.1	25.6	20.7	20.3	24.9	20.1	17.6
pH	6.9	7.6	8.2	6.9	7.6	8.2	6.9	7.6	8.2	7.0	7.5	8.3
Spec. Cond mS	5.5	5.7	5.6	5.5	5.7	5.6	5.5	5.8	5.6	5.5	5.2	5.5
Disolved Oxygen mg/l	2.0	5.8	6.9	1.5	5.3	6.9	1.2	5.2	7.4	1.5	4.9	7.2

PARAMETER	16-Sep-94			20-Sep-94			29-Sep-94			6-Oct-94		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	5.8		40	8.5		40	7.1	32	40	8.5	32	40
Temperature C	23.3	18.0	14.2	23.9	19.8	16.0	24.3	18.7	15.0	22.8	16.7	12.7
pH	7.2	7.8	8.4	7.1	8.0	8.3	7.2	7.8	8.4	7.2	7.9	8.5
Spec. Cond mS	5.5	5.6	5.50	5.5	5.5	5.5	5.5	5.7	5.5	5.5	5.7	5.5
Disolved Oxygen mg/l	1.6	6.0	7.80	1.6	6.1	7.6	1.4	5.3	7.5	1.4	5.5	8.5

PARAMETER	13-Oct-94			21-Oct-94			28-Oct-94			4-Nov-94		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	7.1	32	36	7.1	32.0	40	4.7	29.0	40	4.7	29.0	40
Temperature C	22.7	17.8	13.0	23.1	14.9	12.6	22.1	15.2	9.9	22 3	14.7	9.1
pH	7.3	7.9	8.5	7.3	8.3	8.6	7.4	7.9	8.6	7 3	7.9	8.5
Spec. Cond mS	5.5	5.7	5.50	5.5	5.7	5.4	5.0	5.7	5.5	5.4	5.7	5.4
Disolved Oxygen mg/l	1.6	5.4	7.70	1.5	7.0	8.3	1.6	5.8	8.4	1 5	5.9	8.1

PARAMETER	9-Nov-94			17-Nov-94			22-Nov-94			9-Dec-94		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	4.7	29	40	4.7	26	32	4.7	23	29	2 1	21	32
Temperature C	22.4	14.4	9.0	22.4	14.0	9.1	18.1	1 .0	7.9	17.9	11.3	5.4
pH	7.4	7.9	8.7	7.4	7.9	8.6	7.5	8.0	8.8	7 7	8.1	8.8
Spec. Cond mS	5.5	5.7	5.5	5.4	5.6	5.6	5.5	5 1	5.2	5.5	5.6	5.4
Disolved Oxygen mg/l	1.6	5.8	8.6	1.8	5.9	8.1	2.3	6.5	7.3	2.7	5.4	7.7

SUNNYSIDE COGENERATION ASSOCIATES

SURFACE WATER-BASELINE-COARSE REFUSE SEEP MONITORING performed by EWP

PARAMETER	15-Dec-94			22-Dec-94			6-Jan-95			12-Jan-95		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	2.8	26	40	2 8	21	40	2 1	21	40	2.1	21	40
Temperature C	17.3	12.2	5.9	18.1	13.4	7.0	17.3	11 2	3.7	17.5	11.1	5.2
pH	7.7	8.1	8.9	7.6	8.0	8.9	7.8	8 0	9.1	7.8	8.1	8.9
Spec. Cond mS	N/A	5.5	5.4	5.5	4.5	5.3	5.4	5.6	5.3	5.5	5.4	5.4
Disolved Oxygen mg/l	2.8	4.9	7.5	2.8	5.6	7.6	2.7	5.6	9.0	2.6	5.0	8.0

PARAMETER	21-Jan-95			27-Jan-95			1-Feb-95			9-Feb-95		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	2.1	21	40	2.1	26	40	2.1	32	40	2.1	36	43
Temperature C	17.6	11.3	6.0	17.3	11.2	5.8	18.1	11.7	5.2	17.1	11.8	5.7
pH	7.8	8.2	9.1	7.8	8.1	9	7.8	8.3	9.1	7.5	8.1	8.9
Spec. Cond mS	5.4	5.5	5.3	5.5	5.5	5.4	N/A	4.8	5.2	4.9	5.1	5.4
Disolved Oxygen mg/l	2.0	4.5	8.3	2.4	4.4	8.0	2.0	4.4	7.1	2.7	4.5	7.2

PARAMETER	23-Feb-95			28-Feb-95			1-Mar-95			9-Mar-95		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	2.1	36	40	2.1	32	40	2.1	32	40	2.8	32	40
Temperature C	18.0	11.2	5.8	19.8	11.9	5.4	19.2	11.3	5.9	18.5	11.8	6.0
pH	7.9	8.0	9.0	8.1	8.3	8.8	8.1	8.0	8.7	7.8	8.1	8.8
Spec. Cond mS	5.1	5.5	5.4	5.6	5.2	5.1	5.4	5.6	5.3	5.0	5.5	5.2
Disolved Oxygen mg/l	2.5	4.8	8.0	2.1	5.1	7.8	2.6	4.9	8.1	2.7	5.6	7.8

PARAMETER	22-Mar-95			30-Mar-95			5-Apr-95			13-Apr-95		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	2.1	21	29	2.1	26	29	1.5	26	29	1.5	26	29
Temperature C	18.8	12.1	7.1	18.2	11.8	7.8	18.1	11.7	7.9	18.0	11.9	8.4
pH	8.1	8.5	8.9	8.6	8.1	8.2	8.4	8.0	8.6	7.8	8.1	8.6
Spec. Cond mS	5.4	4.8	5.0	5	4.9	5.3	5.1	5.4	5.1	4.8	5.2	5.4
Disolved Oxygen mg/l	2.2	5.0	8.0	2.7	4.5	8.1	2.1	4.9	7.6	2.5	4.7	7.7

PARAMETER	20-Apr-95			27-Apr-95			4-May-95			11-May-95		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	1.0	29	32	1.0	32	32	1.0	32.0	32.0	1.0	29.0	32.0
Temperature C	18.6	12.1	8.1	19.1	13.0	8.5	18.5	12.8	8.1	18.2	13.0	7.4
pH	8.0	8.5	8.5	8.2	8.6	8.7	7.7	8.4	8.3	7.5	8.1	8.5
Spec. Cond mS	5.1	4.8	5.2	5.4	5.0	5.3	5.6	5.1	5.0	5.7	4.9	5.4
Disolved Oxygen mg/l	2.1	5.0	7.5	2.2	4.7	7.8	2.7	4.9	7.2	2.5	4.7	7.6

PARAMETER	19-May-95			25-May-95			2-Jun-95			6/8/95		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	1.0	26.0	29.0	1.0	26.0	29.0	1.0	29.0	29.0	1.0	26.0	26.0
Temperature C	18.1	12.7	7.6	17.9	13.1	7.5	18.2	12.9	7.9	17.0	12.8	7.9
pH	7.8	8.0	8.7	7.9	8.2	8.5	7.5	8.3	8.6	7.5	8.0	8.2
Spec. Cond mS	5.4	5.4	5.1	5.0	5.2	5.2	5.6	4 8	5.6	5.0	4.9	5.3
Disolved Oxygen mg/l	2.2	4.9	7.7	2.3	4.5	7.2	2.4	5.2	7.5	2.2	5.0	7.5

PARAMETER	15-Jun-95			22-Jun-95			30-Jun-95			6-Jul-95		
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	1.0	23.0	26.0	1.0	23.0	23.0	0.7	2 .0	23.0	0.7	18.0	21.0
Temperature C	17.5	11.9	7.8	17.8	11.8	7.8	17.2	12.1	7.9	17.9	12.7	8.2
pH	7.1	8.2	8.0	8.0	7.9	8.3	8.4	8.2	8.1	7.4	8.0	8.5
Spec. Cond mS	5.2	5.2	5.2	5.4	5.1	5.6	5.1	5.1	5.4	5.5	5.3	5.1
Disolved Oxygen mg/l	2.3	4.5	7.3	2.1	4.7	7.6	2.5	5.0	7.7	2.5	4.9	7.2

SUNNYSIDE COGENERATION ASSOCIATES

SURFACE WATER-BASELINE-COARSE REFUSE SEEP MONITORING performed by EWP

PARAMETER	13-Jul-95			19-Jul-95								
	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
Flow gpm	0.4	18	21	0.4	16	18						
Temperature C	18.1	12.8	8.1	18.0	13.1	8.2						
pH	7.2	8.3	8.2	7.5	8.1	8.3						
Spec. Cond mS	5.3	5.2	5.5	5.2	4.8	5.2						
Disolved Oxygen mg/l	2.3	4.5	7.5	2.7	5.2	7.6						

SUNNYSIDE COGENERATION ASSOCIATES
SURFACE WATER-BASELINE-COARSE REFUSE SEEP MONITORING performed by EWP

PARAMETER	19-May-94			16-Jun-94			21-Jul-94		
mg/l	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
NON-FILTERED SAMPLES									
Boron	1.01	1 01	0.75	1 14	1 06	0.91	1.05	1.04	0.9
Aluminum	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	482	447	430	525	479	478	492	441	452
Copper	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	7.21	2.49	0.12	7 17	2 03	ND	6.73	3.99	ND
Magnesium	312	312	281	347	333	321	315	308	303
Manganese	1.32	0.56	ND	1 57	0.56	ND	1.46	0.68	ND
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	33.1	33.9	25.3	40.3	37.1	30.9	34.8	33.7	28
Sodium	492	503	437	473	498	486	441	428	440
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alkalinity-Bicarbonate	456	382	302	466	390	302	480	394	306
Alkalinity-Carbonate	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alkalinity-Hydroxide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Suspended Solids	24	11	ND	21	8	ND	22	28	ND
Total Dissolved Solids	5170	5110	4360	5580	5500	5170	5280	5550	5190
Hardness CaCO3	2640	2620	2400	2860	2800	2530	2900	2840	2610
Nitrogen-Ammonia	0.9	ND	ND	1.3	ND	ND	1.2	ND	ND
BOD total	<6	<6	<6	ND	ND	ND	<6	<6	<2
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenolics	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acidity	51	21	7	43	13	3	52	25	8
Sulfate	2960	3080	2800	3130	3160	2790	3210	3430	3140
FILTERED SAMPLES									
Aluminum	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	0.99	1.00	0.74	1.16	1.05	0.91	1.12	1.1	0.86
Calcium	469	451	429	518	465	469	515	466	431
Copper	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	ND	0.12	ND	0.15	0.14	ND	0.31	0.23	0.13
Magnesium	301	311	277	344	327	315	334	330	288
Manganese	1.27	0.52	ND	1.52	0.54	ND	1.49	0.62	ND
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	32.6	32.3	24.8	40.4	36.7	30.2	37.4	36.8	26.7
Sodium	469	490	439	475	490	477	477	468	415

PARAMETER	25-Aug-94			20-Sep-94						27-Oct-94		
mg/l	CRS	CRC	CRB	CRS		CRC		CRB		CRS	CRC	CRB
NON-FILTERED SAMPLES												
Boron	1.03	1.10	0.91	1.01	1.03	1.04	1.08	0.82	0.79	1.1	1.08	0.85
Aluminum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	473	485	464	471	476	445	453	441	432	500	493	454
Copper	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	7.07	3.47	ND	8.78	8.84	N/A	3.9	ND	ND	8.73	4.48	0.12
Magnesium	301	341	313	297	303	309	320	295	287	316	344	303
Manganese	1.35	0.87	ND	1.43	1.45	1.41	1.13	0.07	0.07	1.45	1.14	0.21
Nickel	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potassium	33.9	36.7	28.9	35.7	36.3	36.5	38.2	28.2	27	37	36.6	27.8
Sodium	421	474	448	437	440	441	461	426	406	455	486	428
Alkalinity-Bicarbonate	480	388	314	470		386		322		486	424	348
Alkalinity-Carbonate	ND	ND	ND	ND		ND		ND		ND	ND	ND
Alkalinity-Hydroxide	ND	ND	ND	ND		ND		ND		ND	ND	ND
Total Suspended Solids	18	17	ND	N/A		14		ND		20	29	ND
Total Dissolved Solids	N/A	5330	5120	5490		5680		5240		5450	5520	5190
Hardness CaCO3	3000	2850	2730	2650		2950		2550		2850	2860	2740
Nitrogen-Ammonia	1.2	ND	ND	1.7		ND		ND		1.7	ND	ND
Acidity	60.4	36.2	20	72		22		12		59	31	2
Sulfate	3310	3330	3560	3260		3820		3070		4220	2650	2590
FILTERED SAMPLES				13-Oct-94								
Aluminum	ND	ND	ND	ND		ND		ND		ND	ND	ND
Boron	1.06	1.13	0.95	1.13		1.14		0 86		0 96	1 30	0 88
Calcium	474	487	483	503		483		470		432	473	469
Copper	ND	ND	ND	ND		ND		ND		ND	ND	ND
Iron	0.55	0.29	ND	ND		ND		ND		0 18	ND	ND
Magnesium	304	344	327	318		338		313		274	340	316
Manganese	1.33	0.56	ND	1.47		1.3		0.19		1 26	1 32	0 22
Nickel	ND	ND	ND	ND		ND		ND		ND	ND	ND
Potassium	34.5	37.6	30.2	37.5		39.2		29.2		32	38.1	29
Sodium	435	487	465	466		491		453		395	485	448
Iron (total)				8.99		3.5		0.14				
Total Suspended Solids				21		9		ND				

SUNNYSIDE COGENERATION ASSOCIATES
SURFACE WATER-BASELINE-COARSE REFUSE SEEP MONITORING performed by EWP

PARAMETER	22-Nov-94			22-Dec-94			21-Jan-95		
mg/l	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
NON-FILTERED SAMPLES									
Boron	1.1	1.10	0 8	1.2	1 1	0.9	1.0	0.9	0.7
Iron	7.19	7.49	ND	7.53	6 45	ND	6.15	3.60	0.12
Manganese	1.46	1.24	0.24	1.49	1.22	0.21	1.37	0.82	0.17
Alkalinity-Bicarbonate	460	420	342	478	422	344	478	392	346
Alkalinity-Carbonate	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alkalinity-Hydroxide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Suspended Solids	16	18	ND	19	16	ND	6	8	ND
Total Dissolved Solids	5430	5660	5200	5360	5530	5200	5480	5340	5030
Hardness CaCO3	2730	2710	2560	2740	2740	2650	2820	2800	2650
Nitrogen-Ammonia	1.5	0.6	ND	1.7	0.6	ND	1.7	ND	ND
Acidity	101	49.4	12.2	62.2	42.4	9	107	49	6
Sulfate	N/A	N/A	N/A	3240	3320	2860	3340	3480	3070
FILTERED SAMPLES									
Boron	1.2	1.1	0.8	1.2	1.1	0.8	1.0	0.8	0.7
Calcium	542	486	476	521	494	490	468	428	428
Iron	1.36	0.59	ND	1.05	0.19	ND	2.04	0.45	ND
Magnesium	345	349	311	333	357	324	293	297	280
Manganese	1.6	1.34	0.25	1.49	1.15	0.21	137	0.81	0.17
Potassium	40.3	36.5	27.2	39.6	37.7	29.5	32.6	27.2	23.3
Sodium	526	527	475	493	524	470	423	396	377

PARAMETER	28-Feb-95			22-Mar-95			27-Apr-95		
mg/l	CRS	CRC	CRB	CRS	CRC	CRB	CRS	CRC	CRB
NON-FILTERED SAMPLES									
Boron	1.3	1.0	0.9	1.1	0.9	0.7	1.2	1.1	0.8
Iron	8.26	4.19	ND	6.78	5.85	ND	7.67	6.44	ND
Manganese	1.64	0.78	0.11	1.38	0.955	0.071	1.52	1.18	0.042
Alkalinity-Bicarbonate	484	404	330	470	408	314	468	422	312
Alkalinity-Carbonate	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alkalinity-Hydroxide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Suspended Solids	12	16	ND	16	9	ND	20	19	ND
Total Dissolved Solids	4950	5070	4780	5250	5090	4770	5440	5520	5120
Hardness CaCO3	2960	2760	2580	2760	2710	2620	2760	2780	2540
Nitrogen-Ammonia	1.7	ND	ND	1.7	0.6	ND	1.6	ND	ND
Acidity	63	35.8	5.0	78	52	12	93.1	48.2	10.2
Sulfate	3270	3220	2940	3200	3220	2910	3420	3250	2820
FILTERED SAMPLES									
Boron	1.4	1.1	0.9	1.2	1	0.7	1.1	1.1	0.8
Calcium	545	487	511	490	457	408	488	460	455
Iron	2.43	0.27	ND	1.1	ND	ND	1.16	ND	ND
Magnesium	350	341	342	310	317	265	330	0.337	305
Manganese	1.62	0.97	0.11	1.48	0.93	0.07	1.47	1.12	0.04
Potassium	41.2	33	29.5	36.1	31.8	23.1	33.9	33.1	23.1
Sodium	482	447	427	437	439	366	449	440	403

Appendix 7-4 Table 2 (cont)

Sunnyside Cogeneration Associates

Surface and Ground Water Sites - Baseline - Field Parameter Data Performed by Huntingdon

Monitoring Location	Location ID	Jun/30/93 Field Parameters					Jul/27/93 Field Parameters					Aug/26/93 Field Parameters				
		Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (mg/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)
Icelander Creek	ICE - 1	29 0	8 08	2200	7 4	185	23 0	8 17	2300	7 2	200	16 0	7 18	2200	7 2	120
Columbia Dugway Spring	F - 2	25 0	8 40	2300	7 8	100	23 0	8 02	1900	5 9	90	15 0	7 18	2150	6 2	100
Coarse Refuse Seep Source	CRS	32 0	6 77	4500	6 2	30	28 0	7 25	3200	2 4	30	25 0	6 81	2800	3 4	40
Coarse Refuse Seep Boundary	CRB	26 0	7 60	4300	8 1	30	21 0	7 87	4600	5 0	30	18 5	6 50	N/A	5 4	60
Draegerton Well	Well - 1	16 0	7 80	1800	7 20	50	17 0	8 18	3100	5 8	50	12 0	6 77	920	4 9	50

Monitoring Location	Location ID	Sep/02/93 Field Parameters					Oct/27/93 Field Parameters					Nov/16/93 Field Parameters				
		Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)
Icelander Creek	ICE - 1	20 0	8 23	2150	5 4	150	3 3	8 50	1200	6 0	150	5 0	8 48	1800	5 6	150
Columbia Dugway Spring	F - 2	17 0	7 54	2100	6 4	100	1 5	8 30	1200	7 0	100	5 3	8 49	1300	6 2	100
Coarse Refuse Seep Source	CRS	28 0	7 12	4600	1 9	40	23 0	6 98	4700	3 5	40	23 2	6 86	4850	2 1	50
Coarse Refuse Seep Boundary	CRB	20 0	7 92	4150	4 9	40	8 3	7 50	3400	6 0	40	7 9	7 1	3300	5 5	40
Draegerton Well	Well - 1	15 0	7 10	1450	5 2	46	7 0	8 00	1300	4 5	50	10 0	7 27	1300	4 6	50

Monitoring Location	Location ID	Dec/09/93 Field Parameters					Jan/13/94 Field Parameters					Feb/28/94 Field Parameters				
		Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)
Icelander Creek	ICE - 1	4 8	8 49	2471	10 3	300	5 1	8 29	2220	6 4	200*	8 9	8 16	1450	7 3	150*
Columbia Dugway Spring	F - 2	6 0	7 82	1800	12 7	150	5 6	8 51	1820	6 2	90*	7 7	7 62	2180	6 9	35*
Coarse Refuse Seep Source	CRS	23 2	6 93	4306	1 9	30	21 2	7 08	4750	2 4	100*	36 5	6 74	4470	0 9	100*
Coarse Refuse Seep Boundary	CRB	5 9	7 94	3900	8 4	40	5 0	8 17	3100	6 0	200*	15 6	7 90	4370	6 8	120*
Draegerton Well	Well - 1	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Monitoring Location	Location ID	Mar/28/94 Field Parameters					Apr/19/94 Field Parameters					May/31/94 Field Parameters				
		Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s.u.)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)
Icelander Creek	ICE - 1	12 9	7 90	2830	6 0	90*	17 2	8.23	2860	6 4	100*	13 1	8 28	2257	9 9	300*
Columbia Dugway Spring	F - 2	13 6	8 01	1500	6 4	26*	15 5	8 4	1800	8 6	36*	12 5	8 16	1650	9 9	35*
Coarse Refuse Seep Source	CRS	23 7	6 51	5400	1 4	100*	26 9	6 83	4550	3 2	10*	23 6	6 64	4650	1 9	8 5*
Coarse Refuse Seep Boundary	CRB	14 6	7 61	3500	6.5	120*	19 3	7 96	4890	7 4	38*	14 1	7 73	4589	9 0	20*
Draegerton Well	Well - 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note

NA Indicates that data is not available due to lack of discharge

NS Indicates that data is not available due to lack of sampling port.

Flow rates were measured as follows:

* The flow rates were estimated due to a lack of an appropriate measuring location.

^ The flow rates were measured using a weir.

The flow rates were measured using a calibrated container and a stopwatch.

• The flow rates were measured using the floating debris method.

Sunnyside Cogeneration Associates

Surface and Ground Water Sites - Baseline - Field Parameter Data Performed by Huntingdon

		Jun/23/94					Jul/21/1994					Aug/22/1994				
		Field Parameters					Field Parameters					Field Parameters				
Monitoring Location	Location I D	Temp. (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)
Icelander Creek	ICE - 1	21.9	8 74	2120	6.5	127*	21 2	8 34	2150	7 1	127*	25 7	8 71	2170	6 3	5*
Columbia Dugway Spring	F - 2	18.7	8 49	2130	7.0	60'	18 9	7 98	3401	7 9	43'	22 4	7 85	3120	8 5	23'
Coarse Refuse Seep Source	CRS	37.2	6 88	5140	1.5	8 51^	25 9	6 96	5480	1 3	8.5^	27 5	7 01	5130	1 2	7 1^
Coarse Refuse Seep Boundary	CRB	20 9	7 99	4950	7.2	40^	20 4	7 82	5200	6 8	40^	24 2	7.50	5130	7 3	36^
Draegerton Well	Well - 1	17 2	7 63	1710	7.2	50'	15 0	8 37	1790	8 8	50'	18 3	7.97	2270	7 9	NA

		Sep/27/1994					Oct/19/94					Nov/21/94				
		Field Parameters					Field Parameters					Field Parameters				
Monitoring Location	Location I D	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)
Icelander Creek	ICE - 1	18 2	8 50	2341	15 4	4	9 9	8 59	2491	8 8	120	1 1	8 84	2165	15 5	20
Columbia Dugway Spring	F - 2	19 5	8 26	2218	14 9	7	10 5	8.35	2340	8 6	30	3 4	8 63	2200	13 9	24
Coarse Refuse Seep Source	CRS	26 2	6 58	5450	1 2	8 5	21 1	6 86	5565	2 3	8 5	18 9	7 11	5088	5 3	4 7
Coarse Refuse Seep Boundary	CRB	21 8	7 86	5180	7 8	40	13 0	8 06	5320	7 8	48	6 1	8 44	5093	13 9	40
Draegerton Well	Well - 1	14 7	7 65	1511	9.4	NA	12 2	8 41	644	7 8	NA	7 1	8 10	1215	10 9	NA

		Dec/19/94					Jan/01/1995					Feb/01/1995				
		Field Parameters					Field Parameters					Field Parameters				
Monitoring Location	Location I D	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)
Icelander Creek	ICE - 1	3 0	8 08	2392 5	15 4	6 0	3 0	8 32	2738 2	11 5	30 0	6 2	8 36	1972 2	9 0	33 0
Columbia Dugway Spring	F - 2	3 5	8 20	2310 0	15 6	26 0	2 1	8 42	2541	8.7	20 0	8 9	8 31	2068 3	7 6	19 0
Coarse Refuse Seep Source	CRS	20 4	6 77	4986 7	3 5	4 7	16 0	6 89	6305 9	3.3	1.5	20 7	6 82	4991 6	1 2	1 5
Coarse Refuse Center Weir	CRM	6 6	7.92	5214 0	14.9	40 0	na	na	na	na	29.0	na	na	na	na	29 0
Coarse Refuse Seep Boundary	CRB	8 3	7 26	1428 3	8 6	NA	3 9	8 05	8704 1	8 9	32.0	13 0	8 10	4962 4	8 0	32 0
Draegerton Well	Well-1	ND	ND	ND	ND	ND	4 7	8 01	942 0	9 1	na	7 5	8.09	619 9	8 0	na

		Mar/27/1995					Apr/24/95					May/24/95				
		Field Parameters					Field Parameters					Field Parameters				
Monitoring Location	Location I D	Temp (C)	pH (s u.)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)	Temp (C)	pH (s u)	SC (umhos)	Dissolved Oxygen (ug/l)	Flow Rate (gpm)
Icelander Creek	ICE - 1	10 7	9 25	2343	9.2	30	10 1	8 44	2237	9 3	44	12 9	8 43	2390	7 5	72 0
Columbia Dugway Spring	F - 2	10 0	8 4	2251	7.9	20	11 5	8 25	2240	9 5	33.3	12.0	8 38	2390	7 0	70 0
Coarse Refuse Seep Source	CRS	18 8	7 12	5492	2.7	1 5	18 9	6 82	5470	3 5	1.5	19.7	7 08	5456	2 8	1 0
Coarse Refuse Center Weir	CRM	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Coarse Refuse Seep Boundary	CRB	12 6	8 17	5133	8.1	43	14 3	8 00	5193	10 0	26	16.2	8 13	5271	7 7	26 0
Draegerton Well	Well-1	6 9	7 9	791.0	8.7	na	8 8	7 83	755 0	9 1	na	9.2	8 21	677 0	7 9	na

Note

NA indicates that data is not available due to lack of discharge

NS indicates that data is not available due to lack of sampling port

Flow rates were ~~measured as follows~~

* The flow rates were estimated due to a lack of an appropriate measuring location.

^ The flow rates were measured using a weir

' The flow rates were measured using a calibrated container and a stopwatch

• The flow rates were measured using the floating debris method.

Sunnyside Cogeneration Associates

Surface and Ground Water sites - Baseline - Analytical Results (monitoring performed by Huntingdon)

SAMPLE LOCATION		Analytical Parameters															
		Metals (mg/l)												Inorganics (mg/l)			
		Aluminum Dissolved	Arsenic Dissolved	Boron Dissolved	Cadmium Dissolved	Copper Dissolved	Iron Dissolved	Iron Total	Lead Dissolved	Mangenese Dissolved	Mangenese Total	Molybdenum Dissolved	Selenium Dissolved	Zinc Dissolved	Electrical Conductivity	Oil & Grease	Sulfide as S
ICE - 1	06/93	0 2	<0 002	0 3	<0 003	<0 02	<0 05	0 08	<0 01	<0 02	<0 02	<0 05	<0 002	<0 02	na	<1	<1
	10/93	0 1	<0 002	0 3	<0 001	<0 02	<0 05	<0 05	<0 002	<0 02	<0 02	<0 05	<0 002	<0 02	2410	<1	<1
	1/94	<0 5	<0 002	<0 5	<0 001	<0 10	<0 25	0 3	<0 002	<0 1	<0 1	<0 25	<0 002	<0 1	2260	2	na
	4/94	<1 0	<0 002	<1 0	<0 001	<0 2	<0 5	0 35	<0 002	<0 2	0 1	<0 5	<0 002	<0 2	2800	<1	na
	7/94	<0 1	<0 002	0.2	<0 001	<0 02	<0 05	0 07	<0 002	<0 02	<0 02	<0 05	<0 002	<0 02	2220	<1	na
	9/94	0 3	<0 002	0 2	<0 001	<0 02	<0 05	0 16	<0 002	<0 02	<0 02	<0 05	<0 002	<0 02	2350	<1	na
	12/94	0 2	<0 002	0 2	<0 001	<0 02	<0 05	0 26	<0 002	<0 04	<0 02	<0 05	0 003	<0 02	2500	<1	na
	3/95	<0 1	<0 002	0 2	<0 001	<0 02	<0 05	0 29	<0 002	<0 04	<0 02	<0 05	<0 002	<0 02	2540	8	<1
F - 2	06/93	0 2	<0 002	0 3	<0 003	<0 02	<0 05	0 26	<0 01	<0 02	0 04	<0 05	<0 002	<0 02	na	<1	<1
	10/93	0 2	<0 002	0 3	<0 001	<0 02	<0 05	0 41	<0 002	0 04	0 06	<0 05	<0 002	1 02	2240	3	<1
	1/94	<0 5	<0 002	<0 5	<0 001	<0 10	<0 25	0 3	<0 002	<0 1	0 1	<0 25	<0 002	<0 1	1830	<1	na
	4/94	<1 0	<0 002	<1 0	<0 001	<0 2	<0 5	0 3	<0 002	<0 2	0 1	<0 5	<0 002	<0 2	2280	<1	na
	7/94	<0 1	<0 002	0 2	<0 001	<0 02	<0 05	0 54	<0 002	<0 02	<0 02	<0 05	<0 002	<0 02	2280	<1	na
	9/94	0 2	<0 002	0 2	<0 001	<0 02	<0 05	0 54	<0 002	<0 02	0 04	<0 05	<0 002	<0 02	2260	<1	na
	12/94	<0 1	<0 002	0 1	<0 001	<0 02	0 08	0 1	<0 002	<0 02	<0 02	<0 05	<0 002	<0 02	1300	<1	na
	3/95	<0 1	<0 002	0 2	<0 001	<0 02	<0 05	<0 05	<0 002	<0 02	<0 02	<0 05	<0 002	<0 02	2360	2	<1
CRS (HUNT)	06/93	0 6	<0 002	1 0	<0 003	<0 02	<0 12	8 9	<0 01	1 75	1 5	<0 1	<0 002	0 08	na	<1	<1
	10/93	0 5	<0 002	1 1	<0 001	<0 02	6 3	47	<0 002	1 35	2 2	<0 05	<0 002	0 33	5310	<1	<1
	1/94	<0 5	0 005	1 0	<0 001	<0 10	12	21	<0 002	0 33	0 6	<0 25	<0 002	<0 1	4640	<1	na
	4/94	<1 0	<0 002	<1 0	<0 001	<0 2	4 63	11	<0 002	1 9	1 65	<0 5	<0 002	<0 2	5550	4	na
	7/94	0 1	0 002	1 0	<0 001	<0 02	8 4	9 6	<0 002	0 64	0 69	<0 05	<0 002	<0 02	5520	<1	na
	9/94	0 2	0 002	0 6	<0 001	<0 02	9 5	10 4	<0 002	1 08	1 56	<0 05	<0 002	<0 02	5280	<1	na
	12/94	0 2	<0 002	1 2	<0 001	<0 06	9 2	10 2	<0 002	1 38	1 75	<0 05	<0 002	<0 02	5410	<1	na
	3/95	<0 1	<0 002	0 7	<0 001	<0.02	1 23	1 5	<0 002	0 43	0 78	<0 06	<0 002	<0 02	5210	<2	<1 0
CRB (HUNT)	06/93	0 6	<0 002	0 7	<0 003	<0 02	<0 12	<0 12	<0 01	<0 02	<0 02	<0 1	<0 002	0 1	na	<1	<1
	10/93	0 5	<0 002	1 0	<0 001	<0 02	19 2	*<0 05	<0 002	1 35	*<0 02	<0 05	<0 002	0 35	4860	1	1
	1/94	<0 5	<0 002	0 7	<0 001	<0 10	<0 25	<0 25	<0 002	<0 2	<0 1	<0 25	<0 002	<0 1	4890	<1	na
	4/94	<1 0	<0 002	<1 0	<0 001	<0 2	<0 5	0 01	<0 002	0 2	<0 1	<0 5	<0 002	<0 2	4960	<1	na
	7/94	<0 1	<0 002	0 6	<0 001	<0 02	*<0 25	*<0 15	<0 002	*<0 1	*<0 06	0.07	<0 002	0 03	5160	<1	na
	9/94	0 3	<0 002	0 8	<0 001	<0 02	<0 25	<0 25	<0 002	*<0 1	*<0 06	<0 05	<0 002	<0 02	5460	<1	na
	12/94	0 3	<0 002	0 9	<0 001	<0 06	<0 15	0 18	<0 002	0 12	0 15	<0 05	<0 002	<0 02	5190	<1	na
	3/95	<0 1	<0 002	0 5	<0 001	<0 02	<0 25	<0 05	<0 002	<0 10	<0 02	0 07	<0 002	<0 02	4950	<2	<1 0
WELL	06/93	<0	<0 002	0 2	<0 003	<0 02	<0 05	<0 0	<0 01	<0 02	<0 02	<0 05	<0 002	0 02	na	<1	6
	10/93	<0	<0 002	0 3	<0 001	<0 02	<0 05	0 14	<0 002	<0 02	<0 02	<0 05	<0 002	<0 02	2100	<1	<1
	1/94	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	4/94	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	7/94	<0	<0 002	0 1	<0 001	<0 02	<0 05	0 1	<0 002	<0 02	<0.02	<0 05	<0 002	<0 02	1830	2	nd
	9/94	0	<0 002	0 2	<0 001	<0 02	<0 05	0.1	<0 002	<0 02	0 03	<0 05	<0 002	<0 02	1520	<1	nd
	12/94	0	<0 002	0 2	<0 001	<0 02	0 28	0.3	<0 002	0 08	0 09	<0 05	0 004	<0 02	2280	<1	nd
	3/95	<0	<0 002	<0 1	<0 001	<0 02	<0 05	<0.05	<0 002	<0 02	<0 02	<0 05	<0 002	<0 02	861	<1	<1 0

Note:
A < sign indicates the value reported was the practical quantitation limit for this sample using the method described Concentrations of analyte, if present, below this were not quantifiable
* - Higher detection limit reported due to the interferences present in the sample.
na - not applicable
nd - no discharge

Sunnyside Cogeneration Associates

Surface and Ground Water sites - Baseline - Analytical Results (monitoring performed by Huntingdon)

	Analytical Parameters															
	Inorganics (mg/l)			Anions (mg/l)					Cations (mg/l)				Nutrients (mg/l)			
SAMPLE	Settleable	Dissolved	Suspended	Bicarbonate	Carbonate	Total	Chloride	Sulfate	Calcium	Hardness	Magnesium	Sodium	Ammonia	Nitrite	Nitrate	Phosphorous
LOCATION	Solids	Solids	Solids	Alkalinity	Alkalinity	Alkalinity	as Cl	as SO4	as Ca	as CaCO3	as Mg	as Na	as N	as N	as N	Total
ICE 1	<0 1	1920	8	505	0	414	66	1060	126	944	153	318	0 31	<0 05	1 72	0 02
	<0 2	1600	<2	593	0	486	65	777	90	660	105	340	<0 05	<0 05	0 77	0 05
1/94	<0 1	1780	11	519	0	425	59	943	110	850	140	298	0 13	<0 05	0 69	0 05
4/94	<0.1	1860	71	443	11	382	60	985	108	854	142	294	0 08	na	0 32	0 02
7/94	<0 1	1590	<4	541	11	463	62	782	96	759	126	288	<0 05	<0 05	0 48	0 03
9/94	<0 1	1580	7	509	17	446	67	742	60	618	114	320	0 11	<0 05	0 05	0 02
12/94	<0 1	1780	9	593	14	510	74	770	104	787	128	312	<0 05	<0 05	0 5	0 02
3/95	<0 1	1670	<5	524	11	448	72	830	98	772	128	300	0 09	<0 05	0 2	0 029
F - 2	<0 1	1910	10	569	0	466	64	985	144	965	147	306	<0 05	0 06	1 54	0 02
10/93	<0 2	1500	9	622	0	510	59	700	102	650	96	300	0 11	<0 05	0 88	0 06
1/94	<0 1	1390	<5	605	0	496	44	632	94	690	110	260	<0 05	<0 05	0 97	<0 02
4/94	<0 1	1430	7	553	11	472	56	644	97	712	114	274	<0 05	na	0 75	0 02
7/94	<0 1	1500	<5	593	11	505	56	700	108	738	114	273	<0 05	<0 05	0 94	0 02
9/94	<0 1	1540	8	601	6	502	60	690	96	697	111	256	<0 05	<0 05	0 48	<0 02
12/94	<0 1	894	3	492	0	403	23	290	72	452	66	141	<0 05	<0 05	0 66	<0 02
3/95	<0 1	1600	<5	610	0	500	72	760	108	751	117	306	<0 05	<0 05	0 51	<0 02
CRS	0 2	5210	15	553	0	453	97	3380	570	2945	370	550	1 86	<0 05	0 38	0 23
(HUNT)	<0 2	5200	41	548	0	449	96	2930	558	2800	342	543	1 73	<0 05	0 33	0 68
1/94	0 4	4930	16	570	0	467	97	3180	560	2800	340	530	2.11	<0 05	0 22	0 76
4/94	<0 1	4890	34	553	0	453	101	2960	558	2890	350	515	1.42	na	<0 05	0 27
7/94	<0 1	4910	14	559	0	458	105	3080	597	2980	363	501	1 26	<0 05	0 37	0 17
9/94	<0 1	5410	25	608	0	498	106	2930	546	2630	309	471	1 33	<0 05	0 22	0 15
12/94	<0 1	5300	19	608	0	498	101	2930	561	2710	318	525	1 58	<0 05	<0 05	0 14
3/95	<0 1	5090	24	605	0	496	104	3400	560	2750	328	580	1 78	<0 05	<0 05	0 17
CRB	<0 1	4610	<2	394	0	323	131	3010	513	2638	330	483	0 11	<0 05	1 34	<0 02
(HUNT)	<0 2	4700	<5	384	0	315	116	2710	550	2810	350	555	<0 05	<0 05	1 07	0 05
1/94	<0 1	4320	<5	369	0	302	121	2780	490	2400	290	450	<0 05	<0 05	1 33	<0 02
4/94	<0 1	4620	10	380	0	311	134	2630	494	2666	309	450	<0 05	na	0 73	
7/94	<0 1	4490	<5	398	0	326	166	2820	480	2470	310	475	<0 05	<0 05	0 44	0 04
9/94	<0 1	5230	<5	405	0	332	213	2780	486	2460	303	450	<0 05	<0 05	0 39	0 02
12/94	<0 1	5070	<1	440	0	361	197	2800	570	2780	330	507	0 07	<0 05	0 7	<0 02
3/95	<0 1	4880	<5	398	0	326	217	3000	480	2401	292	564	<0 05	<0 05	0 61	0 05
WELL	<0 1	1250	<2	599	0	491	34	510	93	578	84	231	<0 05	<0 05	0 9	<0 02
10/93	<0 2	1400	<2	599	0	491	47	604	99	590	84	276	<0 05	<0 05	1 21	0 05
1/94	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4/94	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
7/94	<0 1	1180	<5	593	0	486	33	479	78	515	78	7	<0 05	<0 05	0 85	<0 02
9/94	<0 1	981	<5	463	0	379	30	412	81	511	75	144	<0 05	<0 05	0 8	<0 02
12/94	<0 1	1690	<2	650	14	557	70	740	117	823	129	291	<0 05	<0 05	0 44	<0 02
3/95	<0 1	512	<5	362	0	297	4	150	50	318	47	70	<0 05	<0 05	0 54	0 028

Note

A < sign indicates the value reported was the practical quantitation limit for this sample using the method described Concentrations of analyte, if present, below this were not quantifiable

* - Higher detection limit reported due to the interferences present in the sample

na - not applicable

nd - no discharge

SUNNYSIDE COGENERATION ASSOCIATES
SURFACE AND GROUND WATER SITES MONITORING - FIELD DATA
BASELINE MONITORING - FIELD DATA

ICE-1 (Hunt)	Minimum	Average	maximum	Sta. Dev.	No. of Samples
Flow Rate	4.0	114.3	300.0	86.04	24
Temperature	1.1	12.6	29.0	8.02	24
pH	7.2	8.4	9.3	0.38	24
Spec. Cond	1200	2227	2860	371.8	24
Dissolved Oxygen	5.4	8.6	15.5	3.10	24
F-2, Whitmore Springs (Hunt)					
Flow Rate	7.0	55.7	150.0	38.42	24
Temperature	1.5	12.0	25.0	6.94	24
pH	7.2	8.2	8.6	0.35	24
Spec. Cond	1200	2121	3401	490.4	24
Dissolved Oxygen	5.9	8.6	15.6	2.82	24
CRS (EWP & Hunt)					
Flow Rate*	0.7	4.2	12.0	2.93	56
Temperature	17.0	22.1	37.2	4.75	80
pH	6.5	7.3	8.6	0.55	80
Spec. Cond	2800	5220	5700	628.3	78
Dissolved Oxygen	0.9	2.3	6.2	0.91	80
CRB (EWP & Hunt)					
Flow Rate*	21.0	36.0	52.0	7.25	56
Temperature	3.7	12.1	26.0	5.87	80
pH	6.5	8.3	9.1	0.48	80
Spec. Cond	2450	5149	8704	728.3	80
Dissolved Oxygen	4.9	7.7	14.9	1.38	80
CRC (EWP)					
Flow Rate	18	28.6	40	4.78	53
Temperature	11	14.9	21.2	3.46	56
pH	7.2	7.9	8.6	0.34	56
Spec. Cond	4500	5401	5800	328.0	56
Dissolved Oxygen	4.4	5.3	7	0.62	56
DRAGERTON WELL (Hunt)					
Flow Rate	46.0	49.5	50.0	1.41	8
Temperature	4.7	12.0	18.3	4.32	16
pH	6.8	7.8	8.4	0.45	16
Spec. Cond	620	1349	3100	682.0	16
Dissolved Oxygen	4.5	7.3	9.4	1.71	16

* These numbers are from EWP data only.

SUNNYSIDE COGENERATION ASSOCIATES SURFACE WATER SITES BASELINE MONITORING - LAB DATA					
CRS (Hunt & EWP)					
	MInimum	Average	Maximum	Sta. Dev.	# of Samples
Aluminum (total)	0.10	0.32	0.60	0.22	5
Aluminum (dissolved)			<0.2		14
Boron (total)	0.60	1.04	1.30	0.16	19
Boron (dissolved)	0.96	1.13	1.40	0.12	12
Calcium (total)	471	532	597	41.14	14
Calcium (dissolved)	432	497	545	33.32	12
Copper (total)			<0.02		6
Copper (dissolved)			<0.02		14
Iron (total)	1.50	10.55	47.00	9.28	20
Iron (dissolved)	0.15	3.62	12.00	3.91	17
Magnesium (total)	297	329	370	23.00	14
Magnesium (dissolved)	274	320	350	23.61	12
Manganese (total)	0.60	1.41	2.20	0.36	20
Manganese (dissolved)	0.33	8.09	137.00	30.34	20
Mercury (total)			<.0005		3
Mercury (dissolved)			<0.0005		3
Nickel (total)			<0.04		6
Nickel (dissolved)			<0.04		6
Potassium (total)	33.10	35.80	40.30	2.59	6
Potassium (dissolved)	32.00	36.51	41.20	3.37	12
Sodium (total)	421	495	580	47.67	14
Sodium (dissolved)	395	461	526	34.93	12
Alkalinity-Bicarbonate	456	514	608	54.52	20
Alkalinity-Carbonate			<1		20
Alkalinity-Hydroxide			<1		12
Total Suspended Solids	6.00	20.15	41.00	7.52	20
Total Dissolved Solids	4890	5254	5580	216.34	19
Hardness CaCO3	2630	2809	3000	112.72	20
Nitrogen-Ammonia	0.90	1.55	2.11	0.28	20
BOD total			<2		3
Cyanide (total)			<0.005		3
Phenolics (total)			<0.01		3
Acidity	43	70	107	20.60	12
Sulfate	2930	3229	4220	292.57	19
Arsenic (total)	0.002	0.003	0.005	0.002	3
Cadmium (total)			<0.001		8
Lead (dissolved)			<0.002		8
Molybdenum (dissolved)			<0.05		8
Selenium (dissolved)			<0.002		8
Zinc (dissolved)	0.08	0.21	0.33	0.18	2
Electric Conductivity	4640	5274	5550	306.21	7
Oil and Grease	<0.9		4.00		1
Sulfide			<1		8
Settleable Solids	0.20	0.30	0.40	0.14	2
Total Alkalinity	449	472	498	22.03	8
Chloride	96	101	106	3.91	8
Nitrite			<0.05		8
Nitrate	0.22	0.30	0.38	0.08	5
Phosphorous (total)	0.14	0.32	0.76	0.25	8

SUNNYSIDE COGENERATION ASSOCIATES
SURFACE WATER SITES
BASELINE MONITORING - LAB DATA

CRC (EWP)

	Minimum	Average	Maximum	Sta. Dev.	# of Samples
Aluminum (total)			<0.2		6
Aluminum (dissolved)			<0.2		6
Boron (total)	0.90	1.04	1.10	0.07	12
Boron (dissolved)	0.80	1.06	1.14	0.09	12
Calcium (total)	441	465	493	23.15	6
Calcium (dissolved)	428	470	494	19.12	12
Copper (total)			<0.02		6
Copper (dissolved)			<0.02		6
Iron (total)	2.03	4.50	7.49	1.70	12
Iron (dissolved)	0.12	0.29	0.59	0.16	8
Magnesium (total)	308	325	344	16.69	6
Magnesium (dissolved)	0.34	304.28	357.00	97.21	12
Manganese (total)	0.56	0.95	1.41	0.28	12
Manganese (dissolved)	0.52	0.93	1.34	0.32	12
Mercury (total)			<.0005		3
Mercury (dissolved)			<0.0005		3
Nickel (total)			<0.04		6
Nickel (dissolved)			<0.04		6
Potassium (total)	33.70	35.75	37.10	1.53	6
Potassium (dissolved)	27	35	39	3.51	12
Sodium (total)	428	472	503	30.77	6
Sodium (dissolved)	396	474	527	37.69	12
Alkalinity-Bicarbonate	382	403	424	15.96	12
Alkalinity-Carbonate			<1		12
Alkalinity-Hydroxide			<1		12
Total Suspended Solids	8.00	15.54	29.00	6.95	13
Total Dissolved Solids	5070	5408	5680	217.62	12
Hardness CaCO3	2620	2785	2950	86.18	12
Nitrogen-Ammonia	0.60	0.60	0.60	0.00	3
BOD total			<6		3
Cyanide (total)			<0.005		3
Phenolics (total)			<0.01		3
Acidity	13.00	35.42	52.00	13.10	12
Sulfate	2650	3269	3820	285.71	11

SUNNYSIDE COGENERATION ASSOCIATES
SURFACE WATER SITES
BASELINE MONITORING - LAB DATA

CRB (Hunt & EWP)

	MInimum	Average	Maximum	Sta. Dev.	# of Samples
Aluminum (total)	0.30	0.43	0.60	0.15	4
Aluminum (dissolved)			<.2		14
Boron (total)	0.50	0.80	1.00	0.12	19
Boron (dissolved)	0.70	0.83	0.95	0.08	12
Calcium (total)	430	484	570	39	14
Calcium (dissolved)	408	460	511	30	12
Copper (total)			<.02		6
Copper (dissolved)			<.02		14
Iron (total)	0.01	0.12	0.18	0.06	6
Iron (dissolved)	0.13	9.67	19.20	13.48	2
Magnesium (total)	281	309	350	18.52	14
Magnesium (dissolved)	265	305	342	23.03	12
Manganese (total)	0.04	0.14	0.24	0.07	9
Manganese (dissolved)	0.04	0.27	1.35	0.37	11
Mercury (total)			<.0005		3
Mercury (dissolved)			<.0005		3
Nickel (total)			<.04		6
Nickel (dissolved)			<.04		6
Potassium (total)	25.3	28.2	30.9	1.81	6
Potassium (dissolved)	23.1	27.2	30.2	2.87	12
Sodium (total)	426	471	564	44.05	14
Sodium (dissolved)	366	435	477	37.67	12
Alkalinity-Bicarbonate	302	353	440	40.94	20
Alkalinity-Carbonate			<1		20
Alkalinity-Hydroxide			<1		12
Total Suspended Solids			<4		20
Total Dissolved Solids	4320	4915	5240	309	20
Hardness CaCO3	2400	2589	2810	124	20
Nitrogen-Ammonia			<.5		12
BOD total			<6		3
Cyanide (total)			<.005		3
Phenolics (total)			<.01		3
Acidity	2.00	8.87	20.00	4.91	12
Sulfate	2590	2899	3560	217.97	19
Arsenic (total)	480	508	570	34.24	8
Cadmium (dissolved)			<0.001		8
Lead (dissolved)			<0.002		8
Molybdenum (dissolved)	0.07	0.07	0.07	0.00	2
Selenium (dissolved)			<0.002		8
Zinc (dissolved)	0.03	0.16	0.35	0.17	3
Electric Conductivity	4860	5067	5460	215.07	7
Oil and Grease			<0.9		8
Sulfide			<1		8
Settleable Solids			<0.1		8
Total Alkalinity	302	325	5550	17.62	8
Chloride	116	162	5550	42.10	8
Nitrite			<0.05		8
Nitrate	0.39	0.83	1.34	0.38	8
Phosphorous (total)	0.02	0.04	0.05	0.02	5

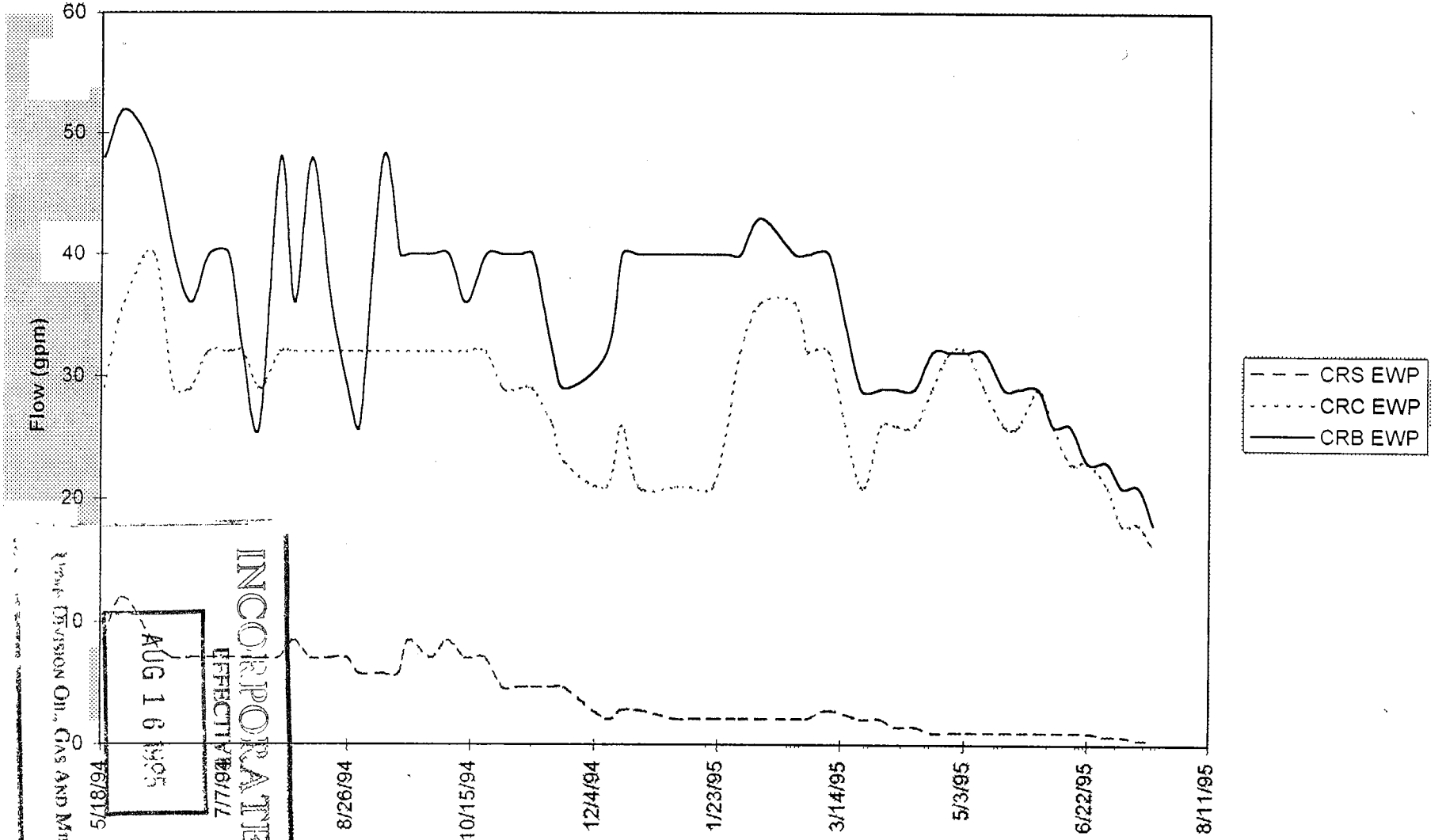
SUNNYSIDE COGENERATION ASSOCIATES
SURFACE WATER SITES
BASELINE MONITORING - LAB DATA

	ICE-1 (Hunt)					F-2, Whitmore Springs (Hunt)				
	Minimum	Average	Maximum	Sta. Dev.	# of Samples	Minimum	Average	Maximum	Sta. Dev.	# of Samples
Aluminum	0.1	0.2	0.3	0.08	4	0.2	0.2	0.2	0.00	3
Arsenic			<0.002		8			<0.002		8
Boron	0.2	0.23	0.3	0.05	6	0.1	0.22	0.3	0.08	6
Cadmium			<0.001		8			<0.001		8
Copper			<0.02		8			<0.02		8
Iron D			<0.05		8	<0.05		0.08		1
Iron T	0.07	0.22	0.35	0.11	7	0.1	0.35	0.54	0.16	7
Lead			<0.02		8			<0.02		8
Manganese Dissolved			<0.003		8	<0.003		0.04		1
Manganese Total	0.1	0.1	0.1		1	0.04	0.07	0.1	0.03	5
Molybdenum			<0.05		8			<0.05		8
Selenium	<0.001		0.003		1			<0.001		8
Zinc			<0.02		8	<0.02		1.02		1
Electric Conductivity	2220	2440	2800	197.06	7	1300	2078.57	2360	384.55	7
Oil and Grease	2	5	8	4.24	2	3	2.5	3	0.71	2
Sulfide			<1		8			<1		8
Settleable solids			<0.1		8			<0.1		8
Dissolved Solids	1580	1722.5	1920	131.01	8	894	1470.5	1910	282.08	8
Suspended Solids	7	21.2	71	27.88	5	3	7.4	10	2.70	5
Bicarbonate Alkalinity	443	528.38	593	49.03	8	492	580.63	622	42.24	8
Carbonate Alkalinity	0	8	17	6.93	8	0	3.5	11	5.07	8
Total Alkalinity	382	446.75	510	40.61	8	403	481.75	510	35.52	8
Chloride	59	65.625	74	5.37	8	23	54.25	72	14.90	8
Sulfate	742	861.13	1060	118.56	8	290	675.13	985	191.17	8
Calcium	60	99	126	19.15	8	72	102.63	144	20.21	8
Hardness as CaCO3	618	780.5	944	105.88	8	452	706.88	965	140.48	8
Magnesium	105	129.5	153	15.47	8	66	109.38	147	22.61	8
Sodium	288	308.75	340	17.07	8	141	264.5	306	53.73	8
Ammonia	0.08	0.144	0.31	0.09	5	<0.034		0.11		1
Nitrite			<0.05		8	<0.05		0.06		1
Nitrate	0.05	0.59	1.72	0.51	8	0.48	0.84	1.54	0.34	8
Phosphorous	0.02	0.03	0.05	0.01	8	0.02	0.03	0.06	0.02	4

SUNNYSIDE COGENERATION ASSOCIATES
SURFACE AND GROUND WATER SITES
BASELINE MONITORING - LAB DATA
WELL (Hunt)

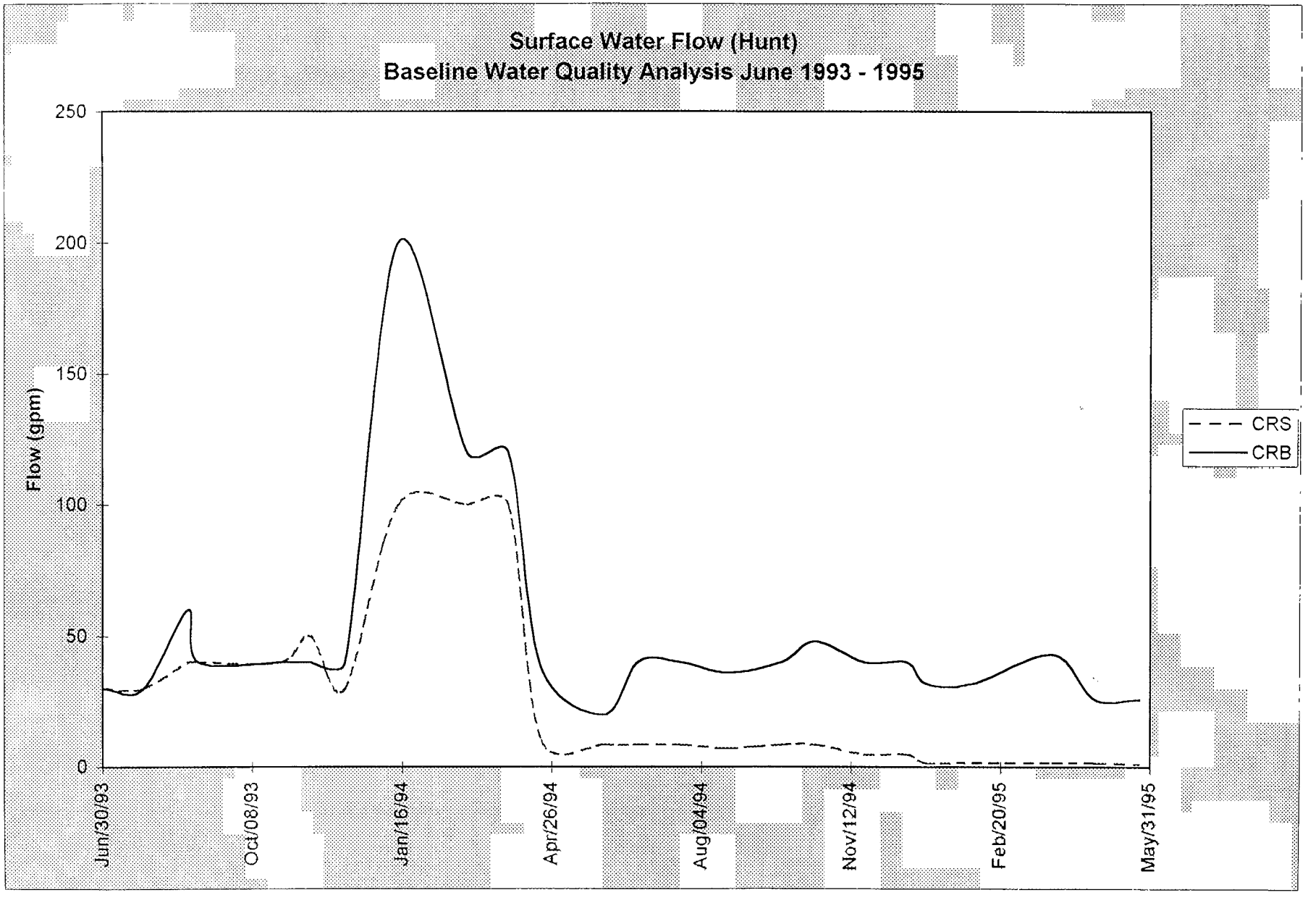
	Minimum	Average	Maximum	Sta. Dev.	# of Samples
Aluminum	0.1	0.15	0.2	0.07	2
Arsenic			<0.002		8
Boron	0.1	0.2	0.3	0.07	5
Cadmium			<0.001		8
Copper			<0.02		8
Iron D	<0.05		0.28		1
Iron T	0.1	0.16	0.3	0.10	4
Lead			<0.002		8
Manganese Dissolved	0.08	0.08	0.08		1
Manganese Total	0.03	0.06	0.09	0.04	2
Molybdenum			<0.05		8
Selenium	<0.002		0.004		1
Zinc	0.02	0.02	0.02		1
Electric Conductivity	1520	1718.2	2280	558.56	5
Oil and Grease	<0.9		2		1
Sulfide	<1		6		1
Settleable solids			<0.1		8
Dissolved Solids	981	1169	1690	399.62	6
Suspended Solids			<2		8
Bicarbonate Alkalinity	463	544	650	108.97	6
Carbonate Alkalinity	0	2.33	14	5.72	6
Total Alkalinity	379	450	557	94.40	6
Chloride	30	36.33	70	21.68	6
Sulfate	412	482.5	740	198.68	6
Calcium	78	86.33	117	22.64	6
Hardness as CaCO3	511	556	823	163.27	6
Magnesium	75	82.83	129	26.47	6
Sodium	7	170	291	115.62	6
Ammonia			<0.05		8
Nitrite			<0.05		8
Nitrate	0.44	0.79	1.21	0.27	6
Phosphorous	0.05	0.04	0.05	0.02	2

Surface Water Flow (EWP)
Baseline Water Quality Analysis June 1993 - 1995



Eckhoff, Watson and Preator Engineering
EWP-F.XLS flow 8/9/95

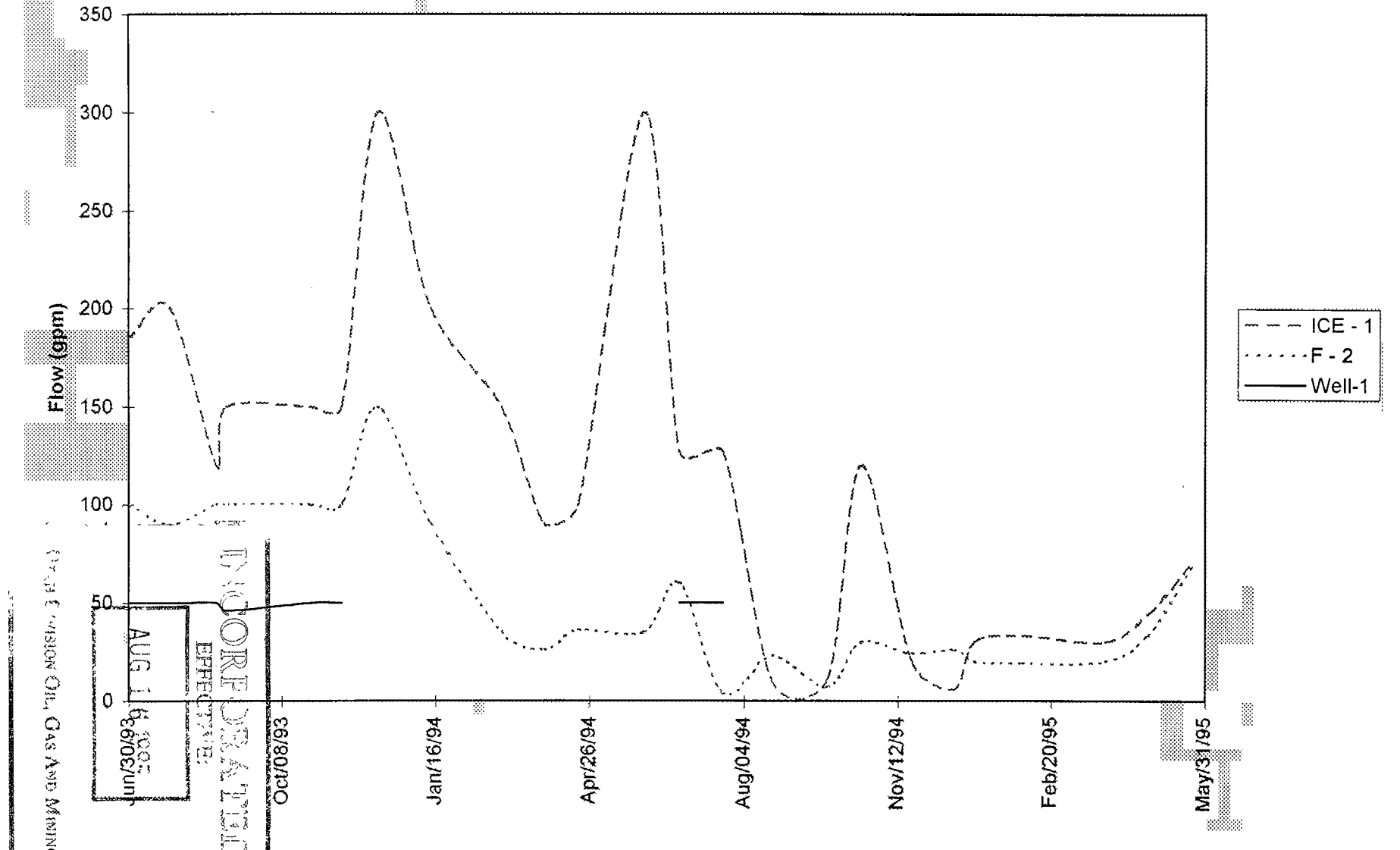
APPENDIX 7-4 FIGURE 1



Eckhoff, Watson and Preator Engineering
HU-FIELD.XLS flow-seep 8/9/95

APPENDIX 7-4 FIGURE 2

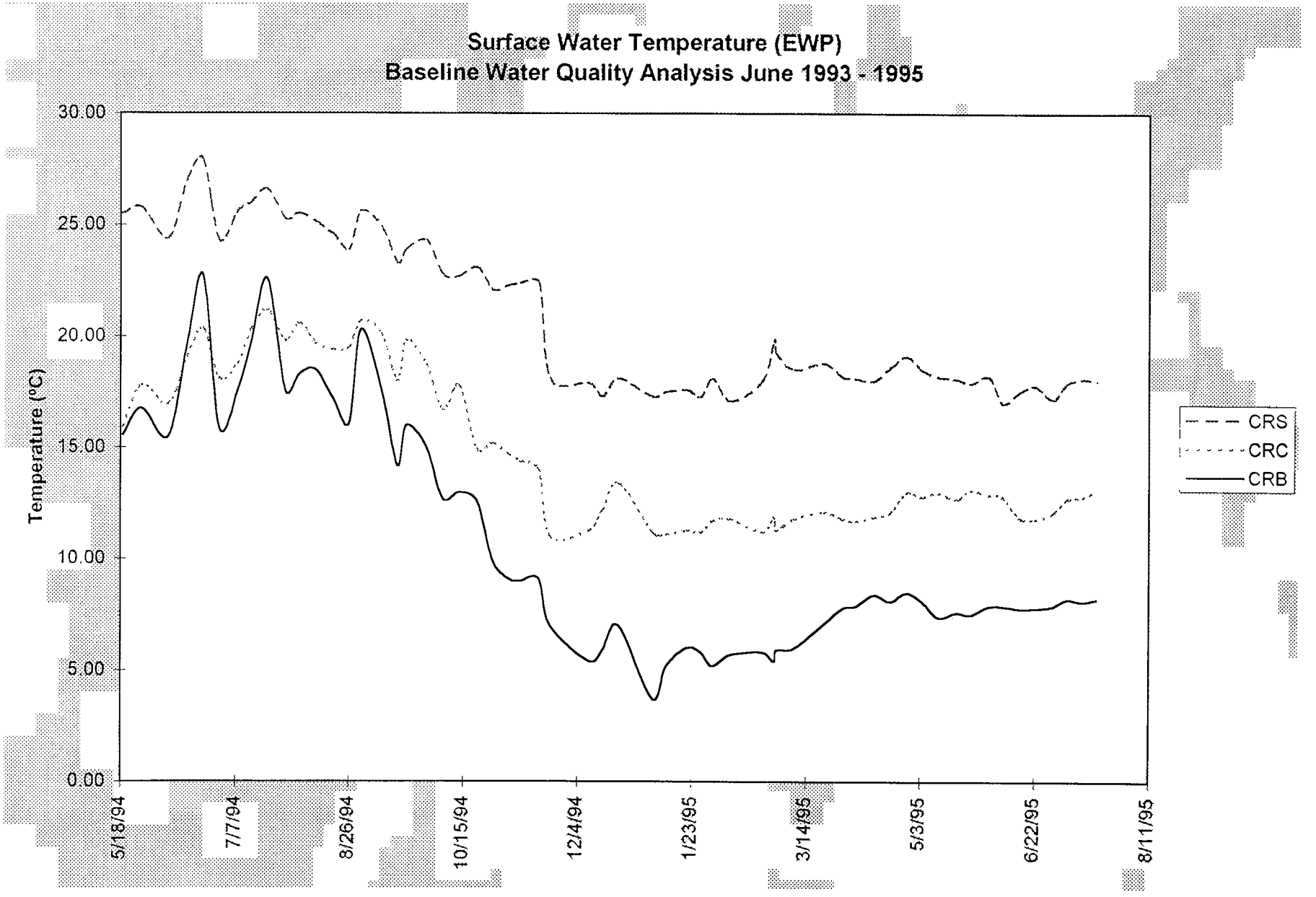
Surface and Ground Water Flow (Hunt)
Baseline Water Quality Analysis June 1993 - 1995



Eckhoff, Watson and Preator Engineering

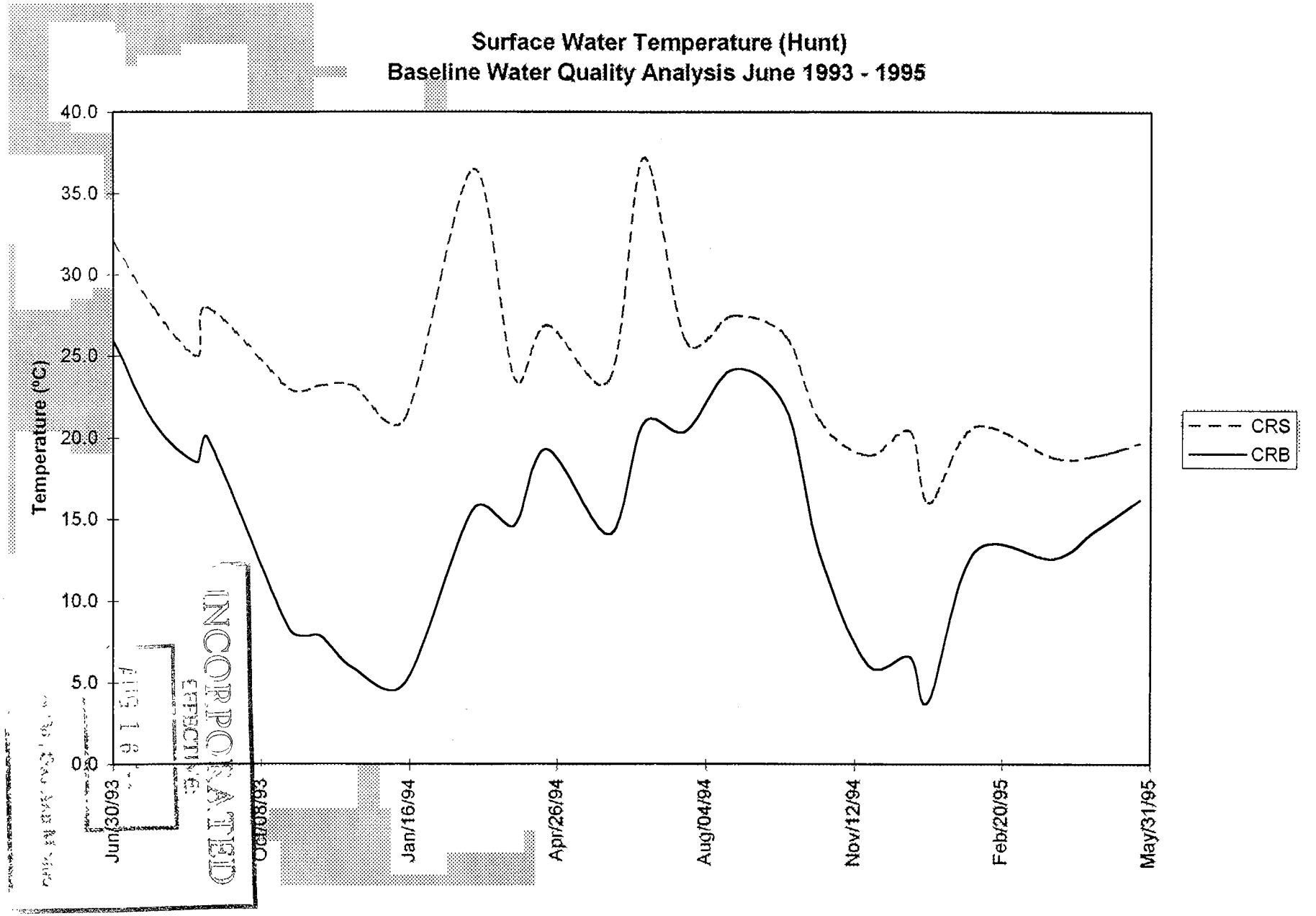
HU-FIELD.XLS flow-other 8/9/95

APPENDIX 7-4 FIGURE 3



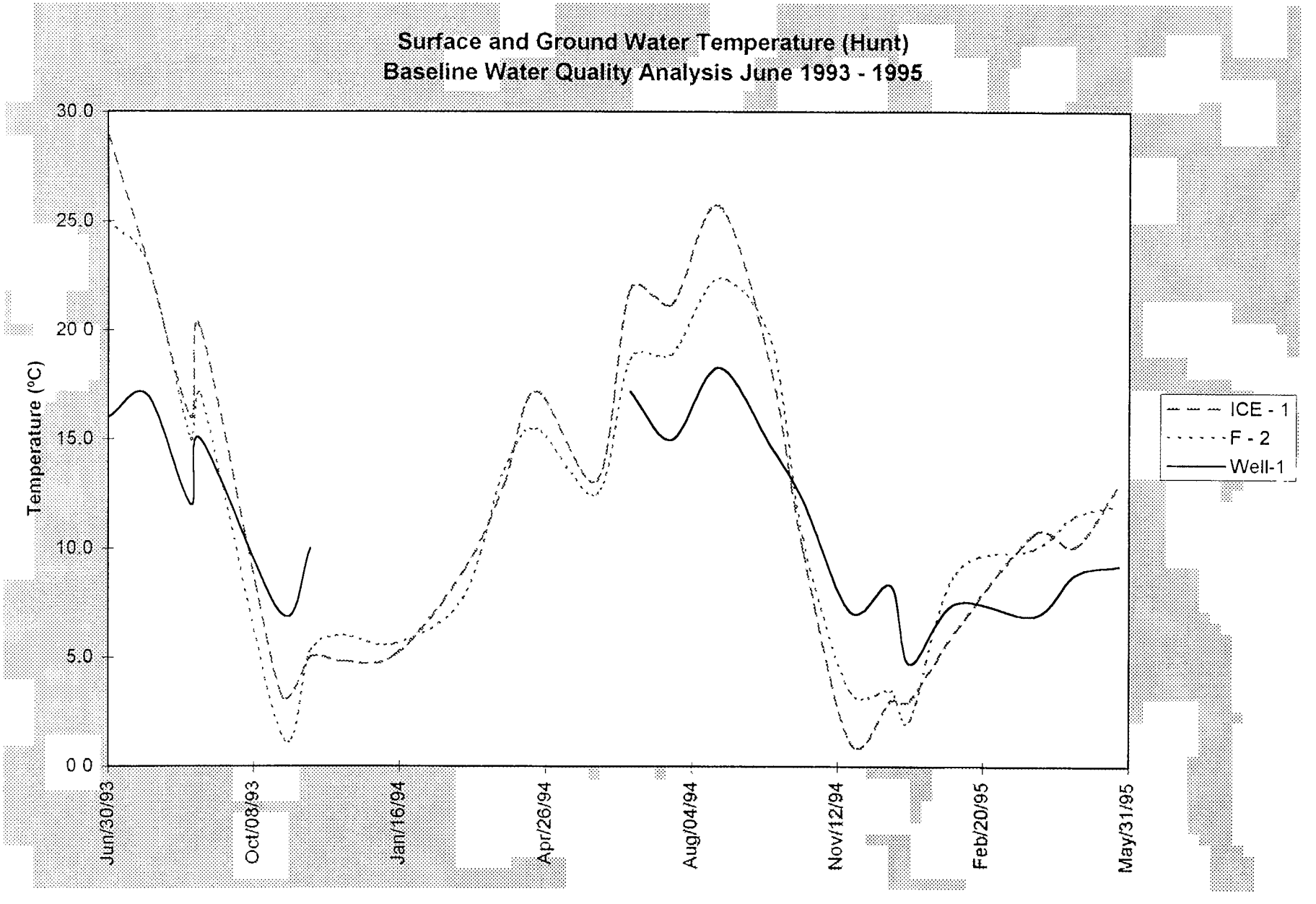
Eckhoff, Watson and Preator Engineering
EWP-F.XLS temp 8/9/95

APPENDIX 7-4 FIGURE 4



Eckhoff, Watson and Preator Engineering
HU-FIELD.XLS temp-seep 8/9/95

APPENDIX 7-4 FIGURE 5



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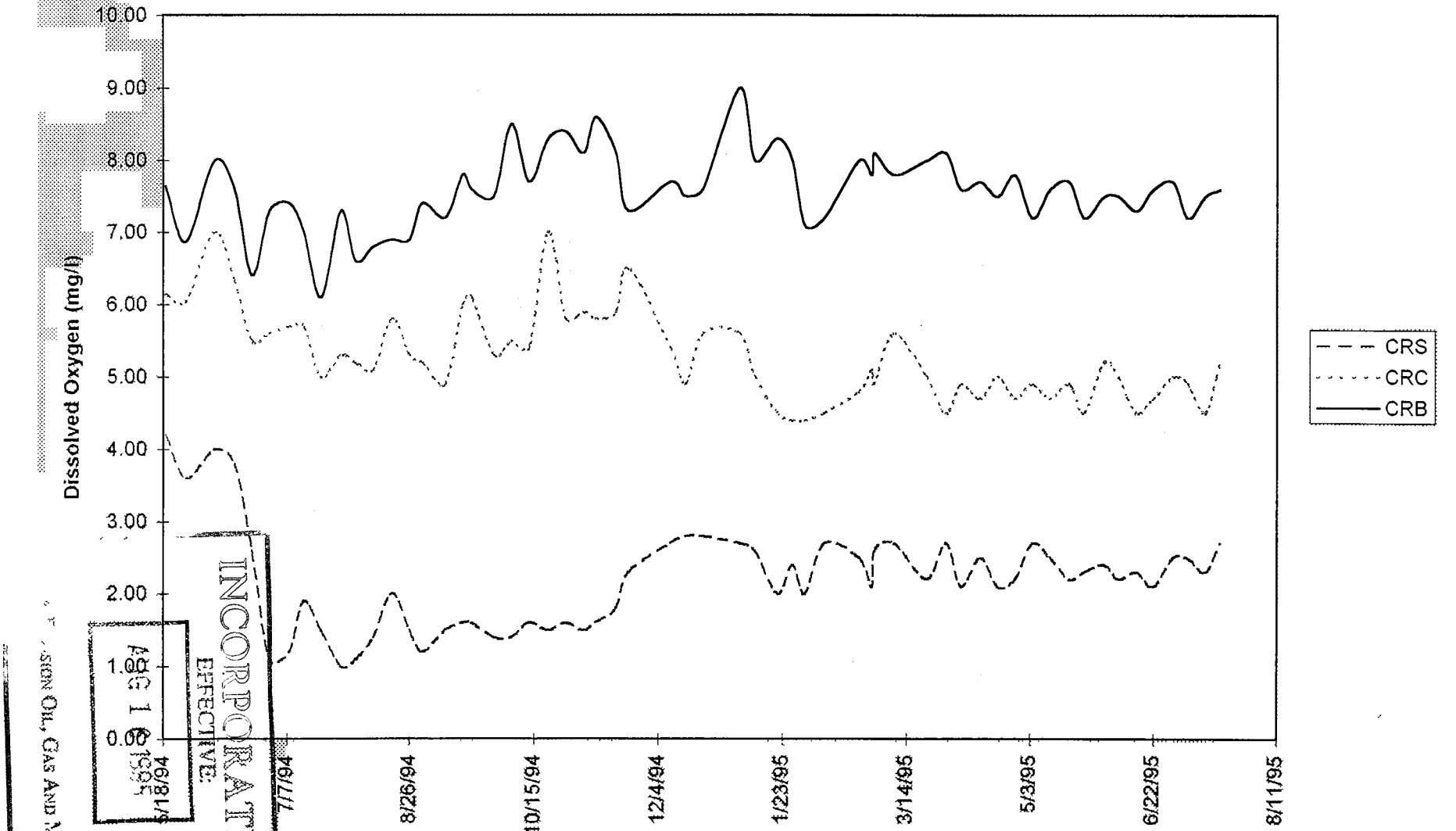
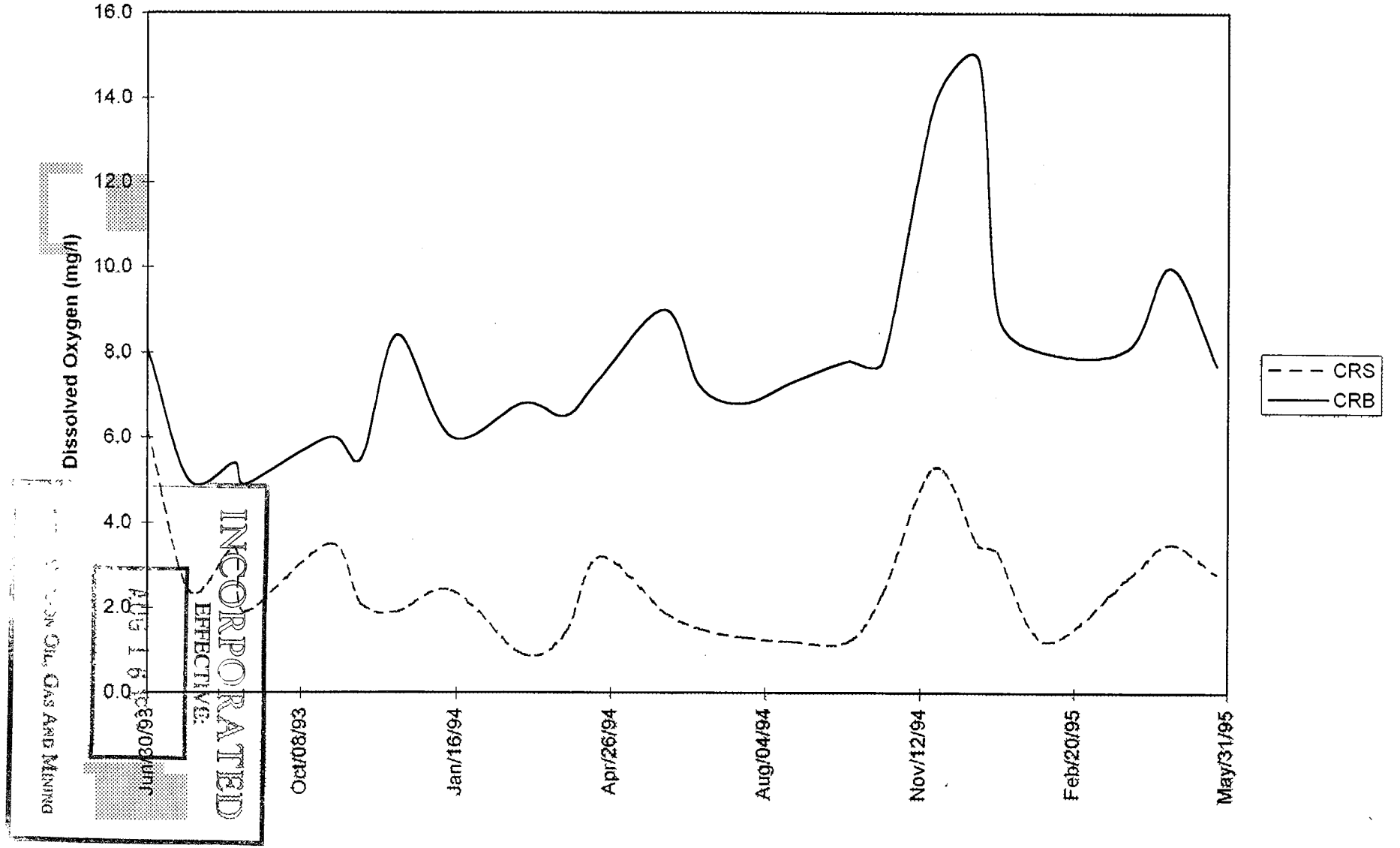
HU-FIELD.XLS temp-other 8/9/95

APPENDIX 7-4 FIGURE 6

Surface Water Dissolved Oxygen (EWP)
Baseline Water Quality Analysis June 1993 - 1995



Surface Water Dissolved Oxygen (Hunt)
Baseline Water Quality Analysis June 1993 - 1995



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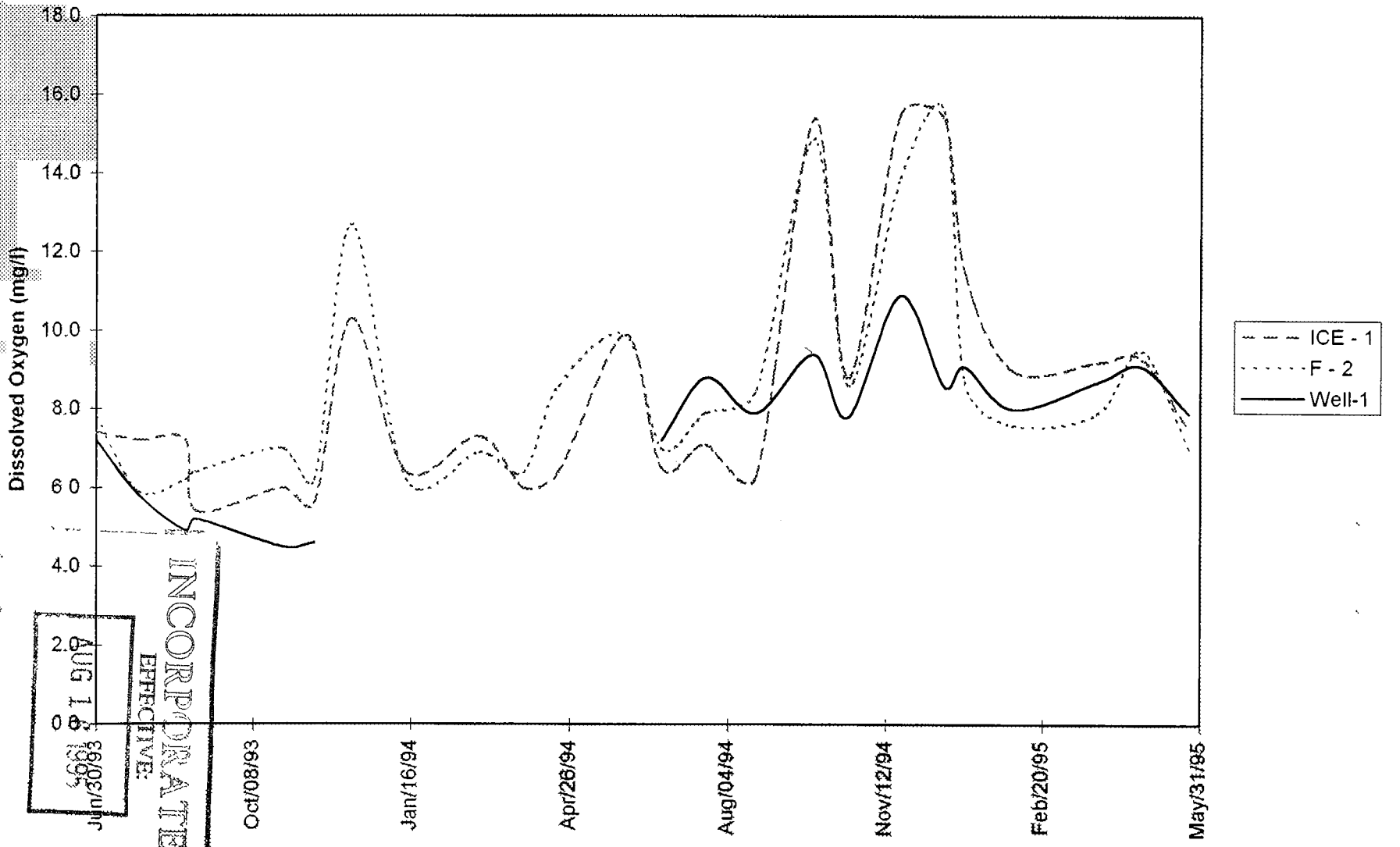
HU-FIELD.XLS do-seep 8/9/95

APPENDIX 7-4 FIGURE 8

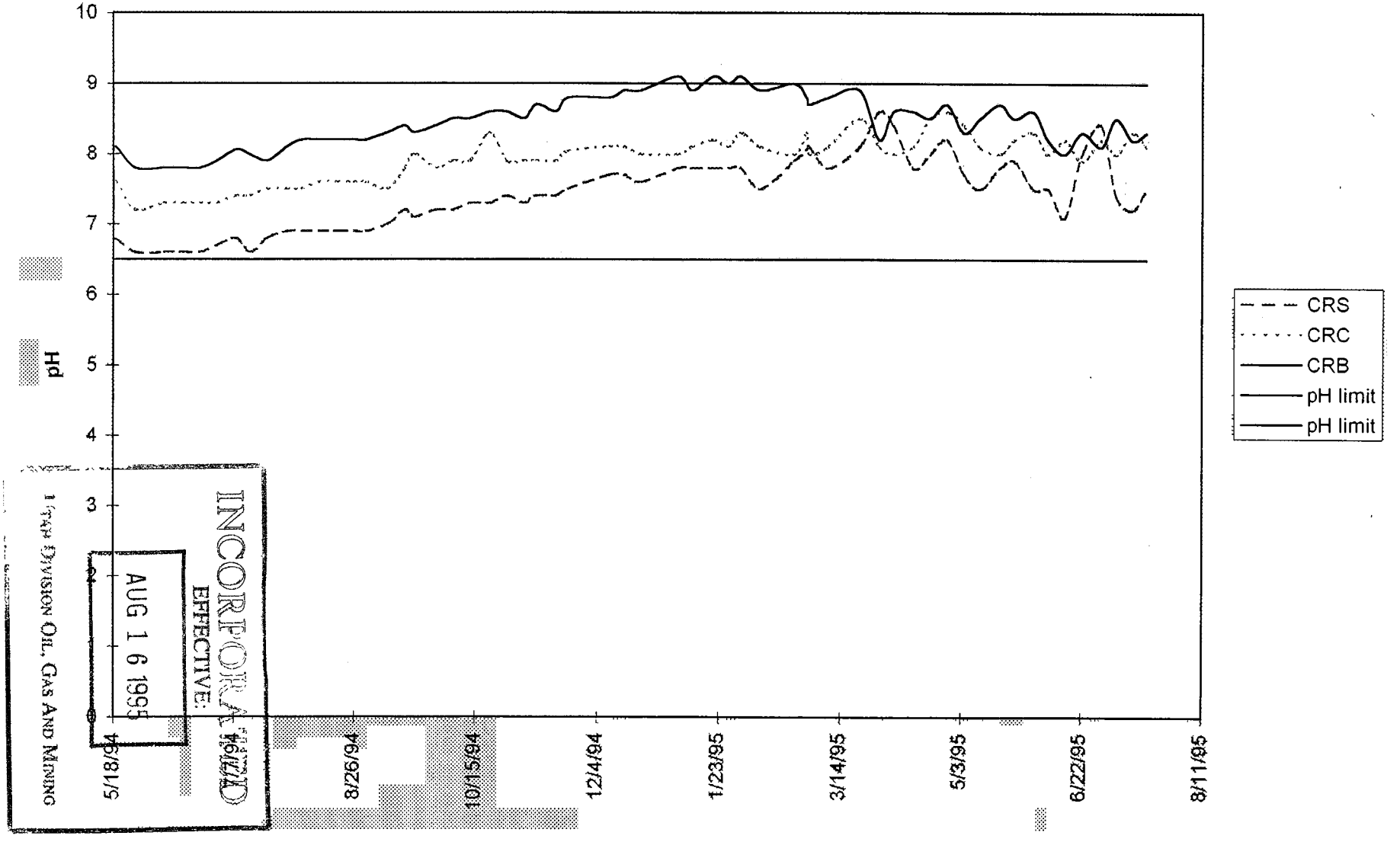
Surface and Ground Water Dissolved Oxygen (Hunt)
Baseline Water Quality Analysis June 1993 - 1995



Eckhoff, Watson and Preator Engineering
HU-FIELD.XLS do-other 8/9/95

APPENDIX 7-4 FIGURE 9

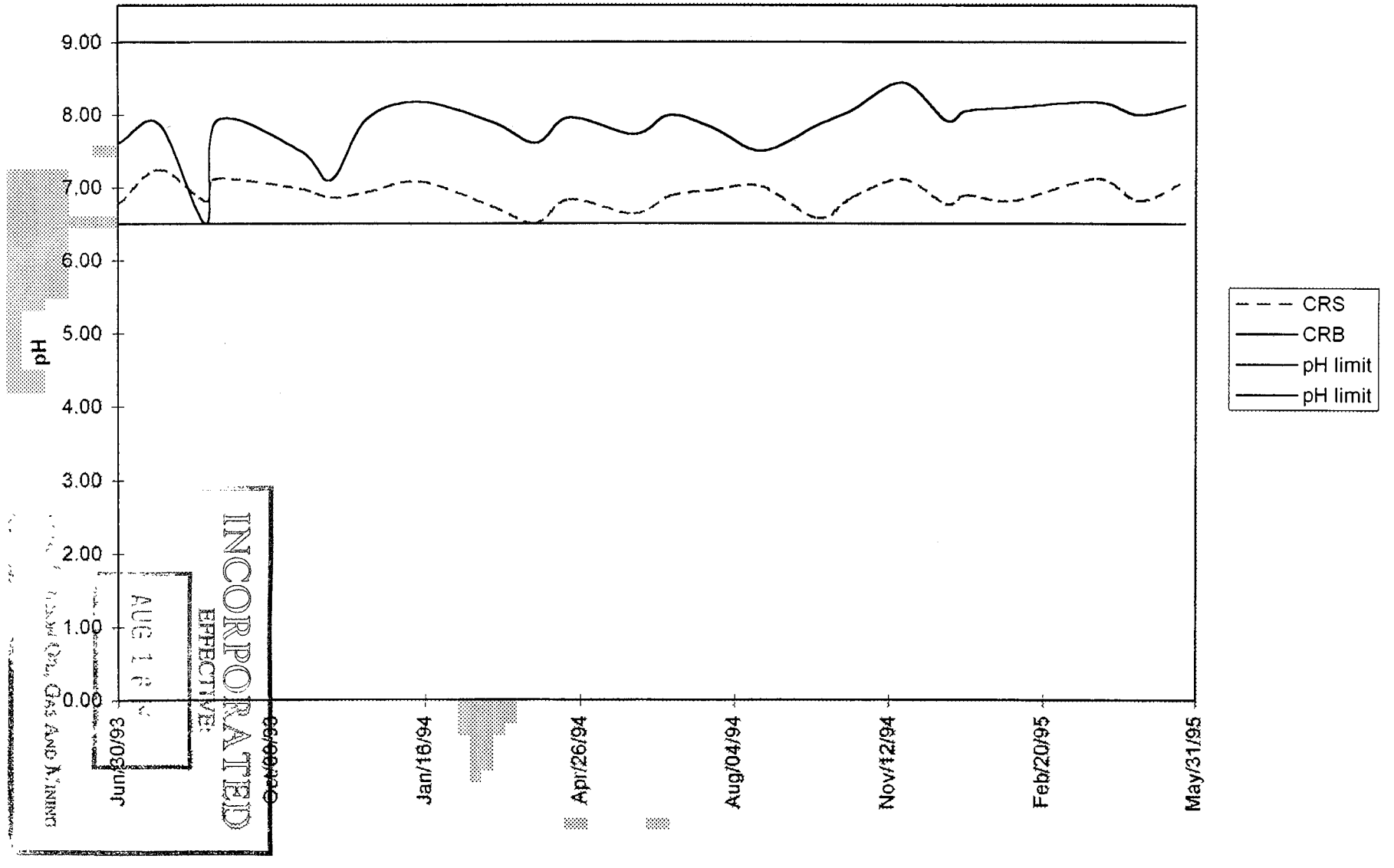
Surface Water pH (EWP)
Baseline Water Quality Analysis June 1993 - 1995



Eckhoff, Watson and Preator Engineering
EWP-F.XLS pH 8/9/95

APPENDIX 7-4 FIGURE 10

Surface Water pH (Hunt)
Baseline Water Quality Analysis June 1993 - 1995



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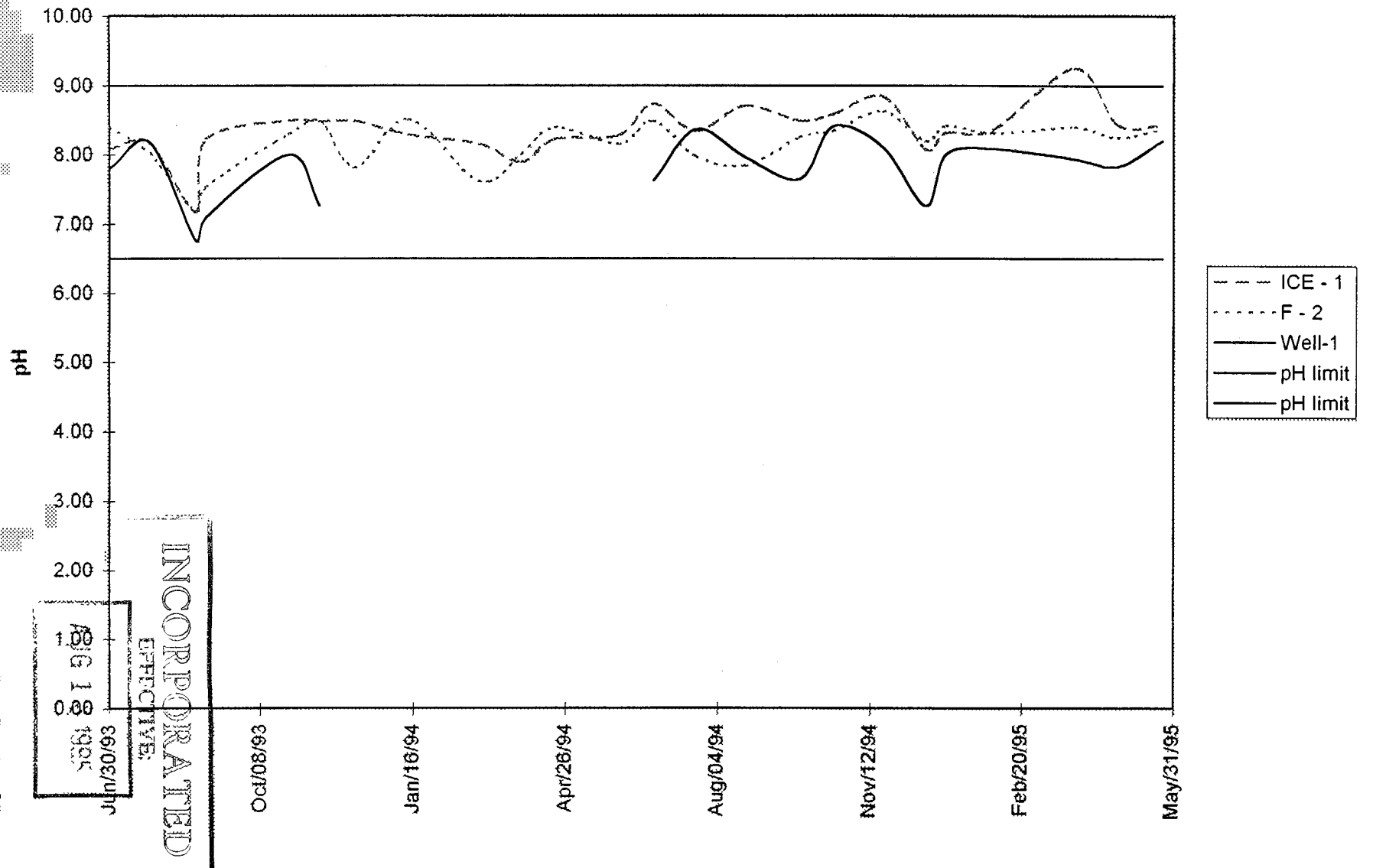
HU-FIELD.XLS pH-seep 8/9/95

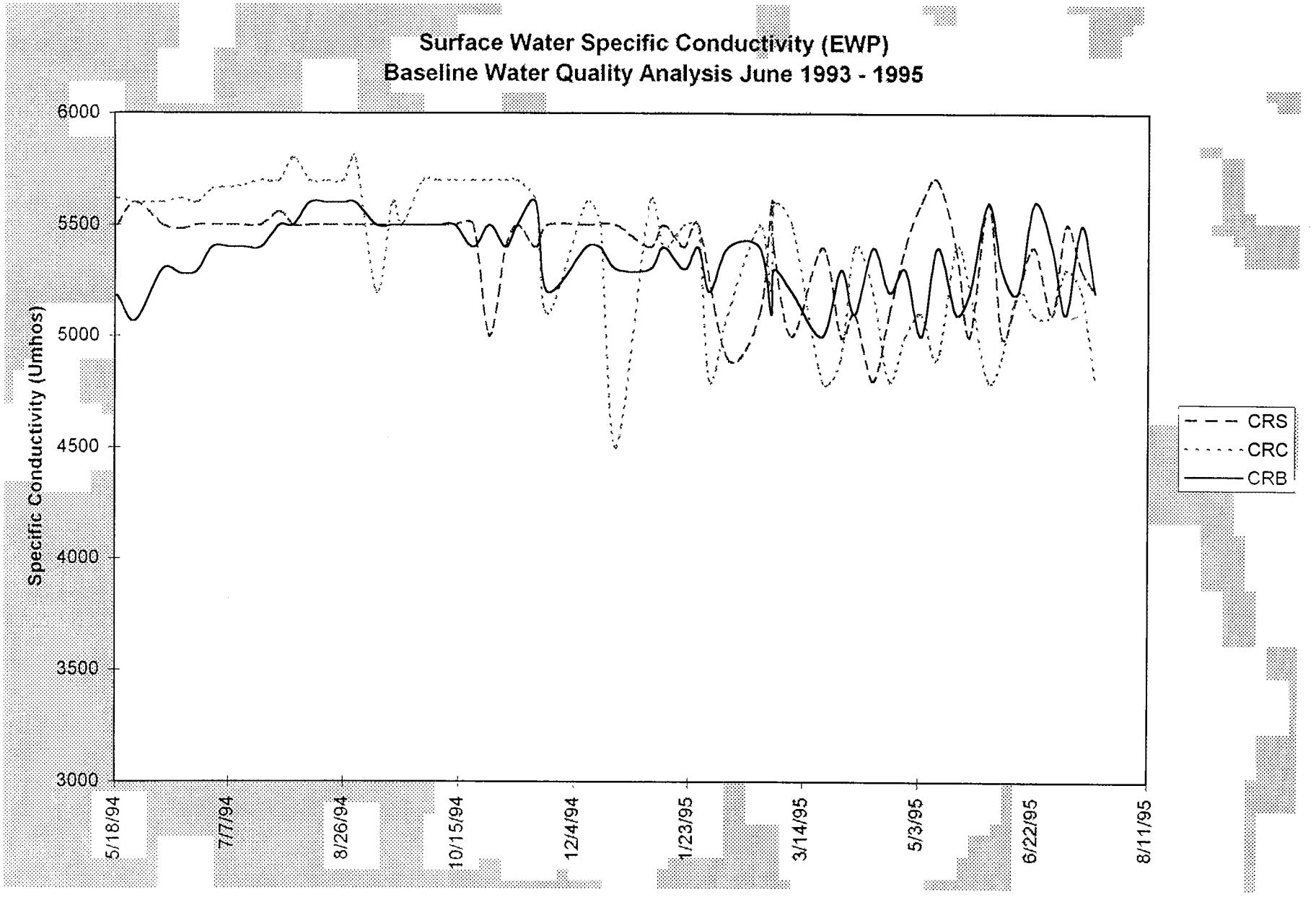
APPENDIX 7-4 FIGURE 11

Surface and Ground Water pH (Hunt)
Baseline Water Quality Analysis June 1993 - 1995



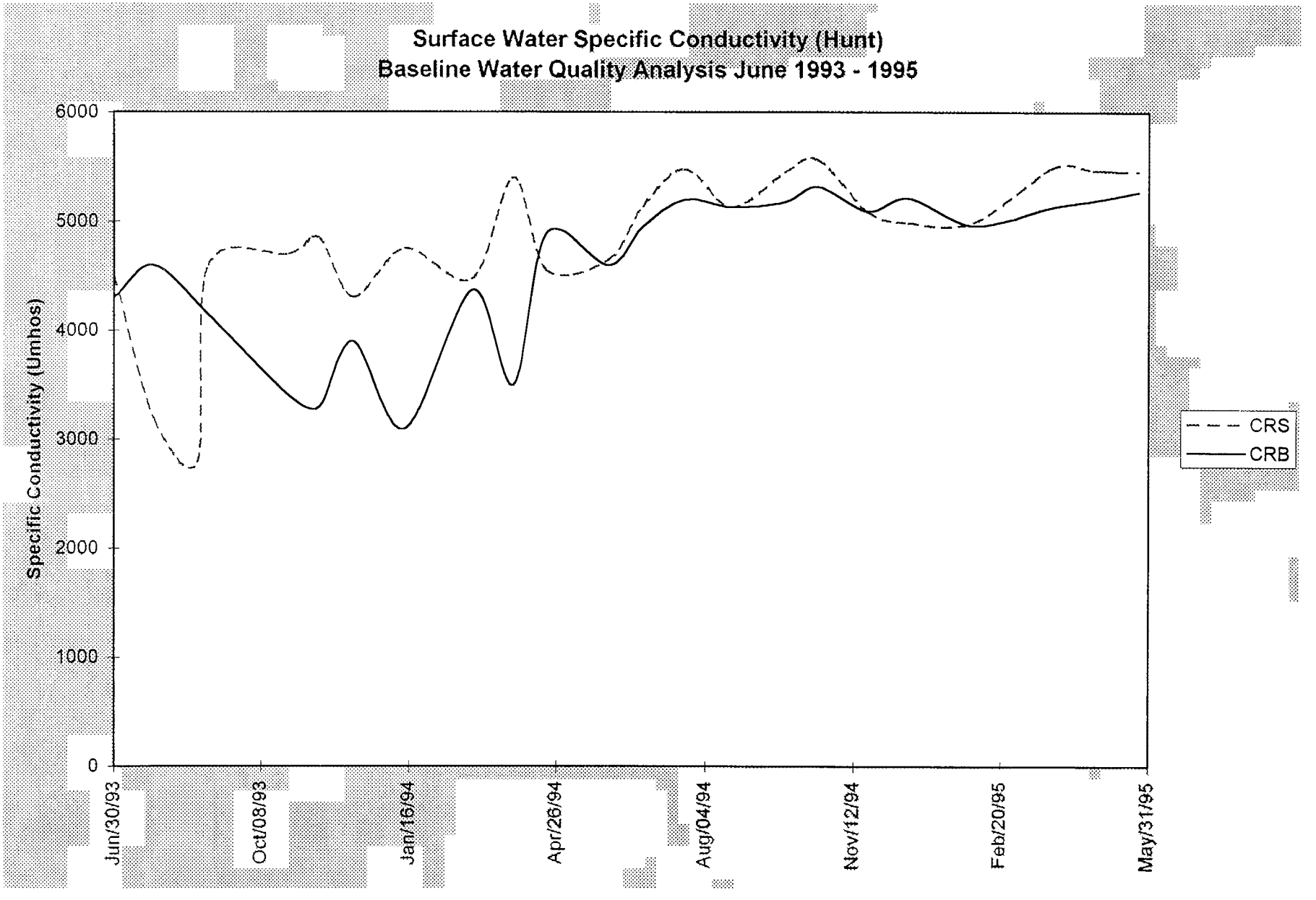
Ecknoff, Watson and Preator Engineering
HU-FIELD.XLS pH-other 8/9/95

APPENDIX 7-4 FIGURE 12



Eckhoff, Watson and Preator Engineering
EWP-F.XLS sp co 8/9/95

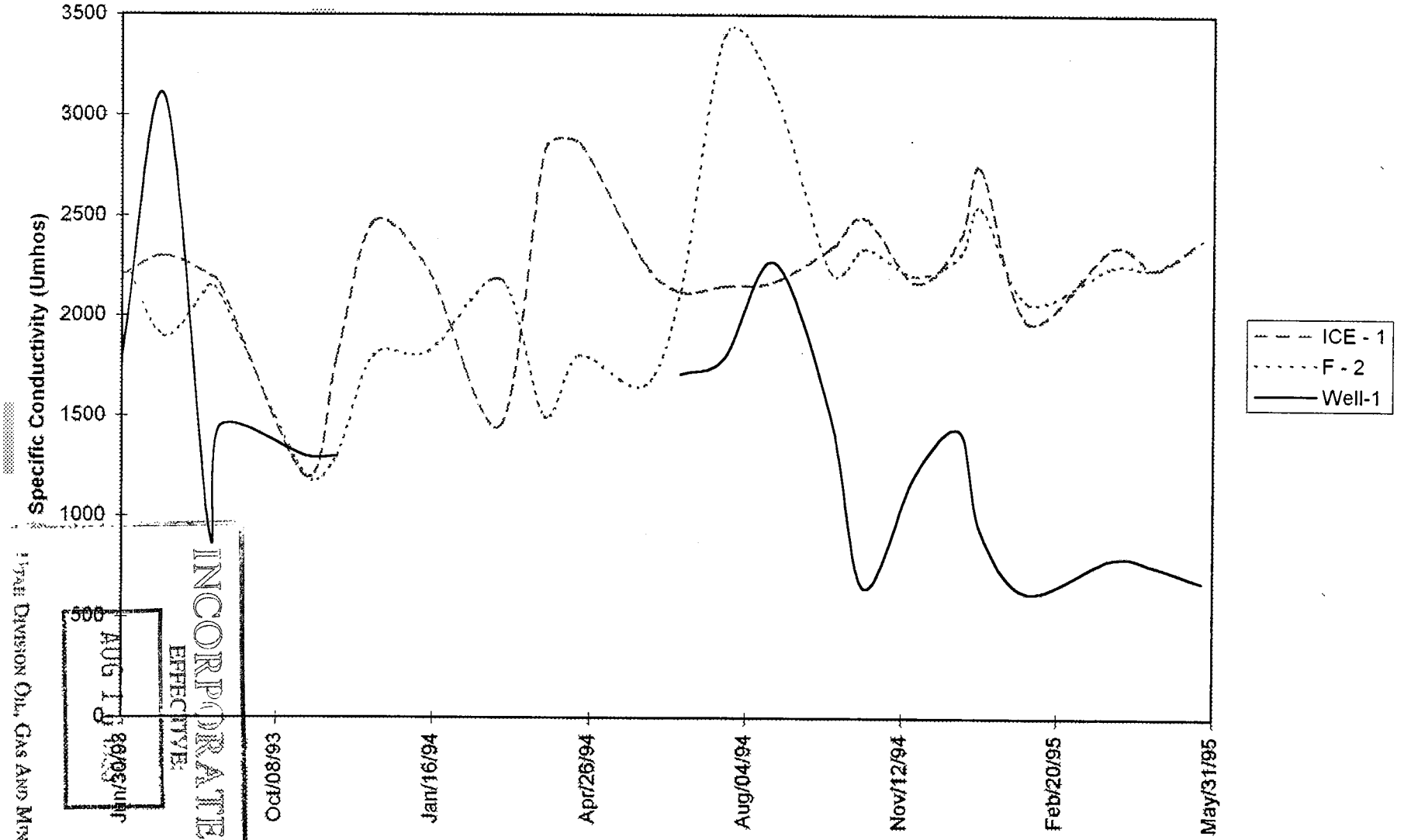
APPENDIX 7-4 FIGURE 13



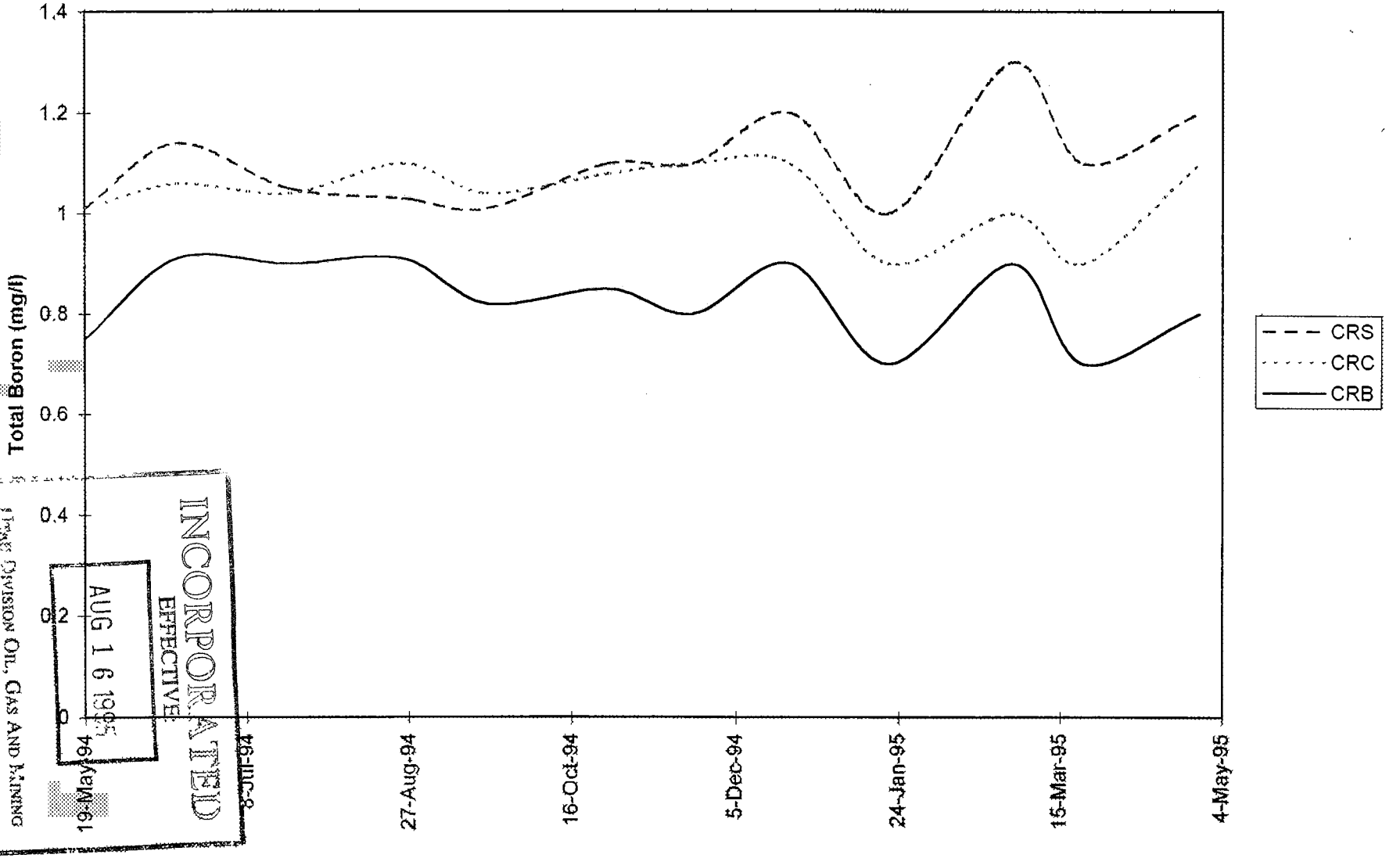
Eckhoff, Watson and Preator Engineering
HU-FIELD.XLS sc-seep 8/9/95

APPENDIX 7-4 FIGURE 14

Surface and Ground Water Specific Conductivity (Hunt)
Baseline Water Quality Analysis June 1993 - 1995



Surface Water Total Boron (EWP)
Baseline Water Quality Analysis June 1993 - 1995



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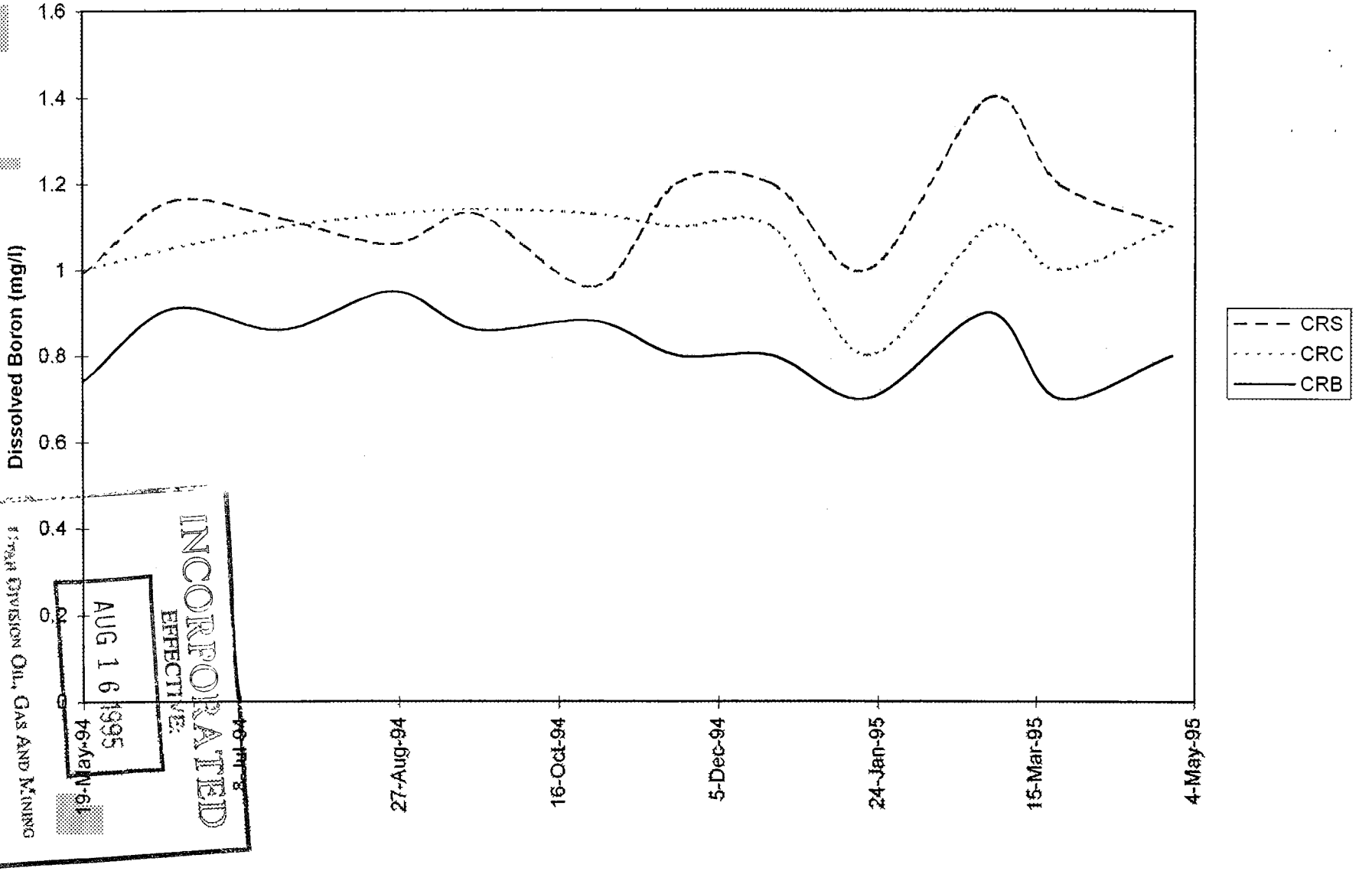
EWP-LAB.XLS boron 8/9/95

APPENDIX 7-4 FIGURE 16

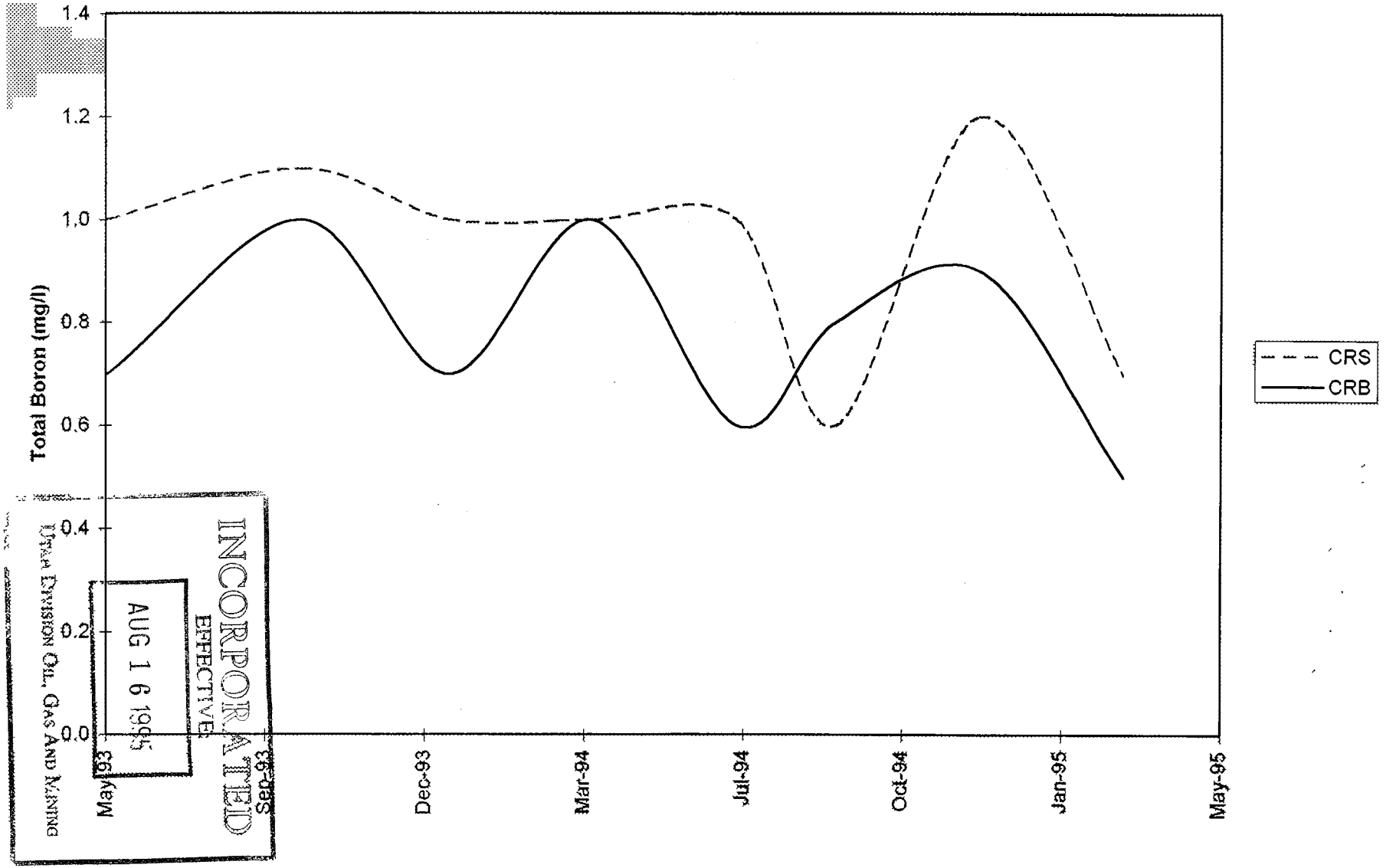
Surface Water Dissolved Boron (EWP)
Baseline Water Quality Analysis June 1993 - 1995



Eckhoff, Watson and Preator Engineering
EWP-LAB.XLS d-boron 8/9/95

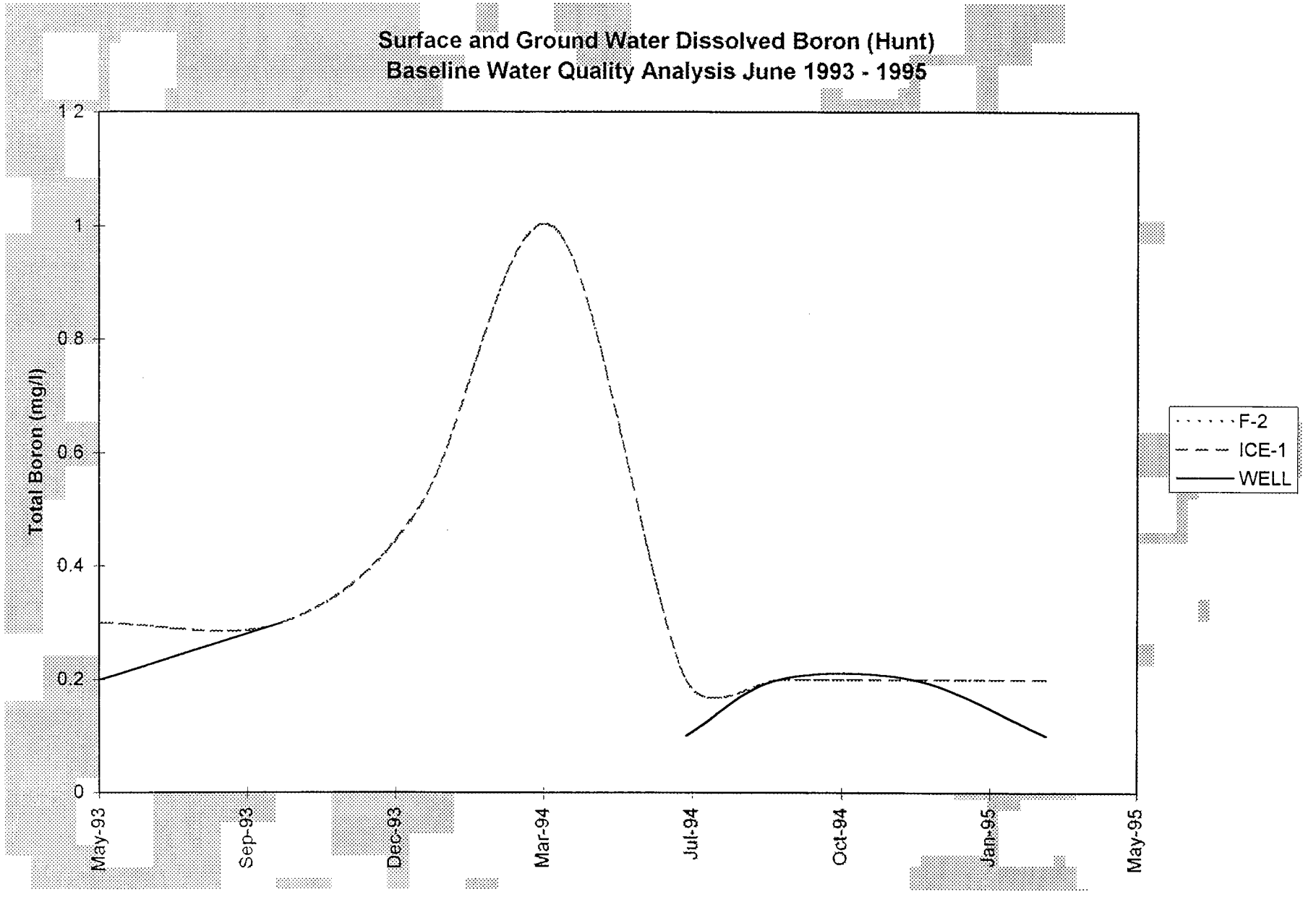
APPENDIX 7-4 FIGURE 17

Surface Water Dissolved Boron (Hunt)
Baseline Water Quality Analysis June 1993 - 1995



Eckhoff, Watson and Preator Engineering
HUNT-LAB.XLS boron-seep 8/9/95

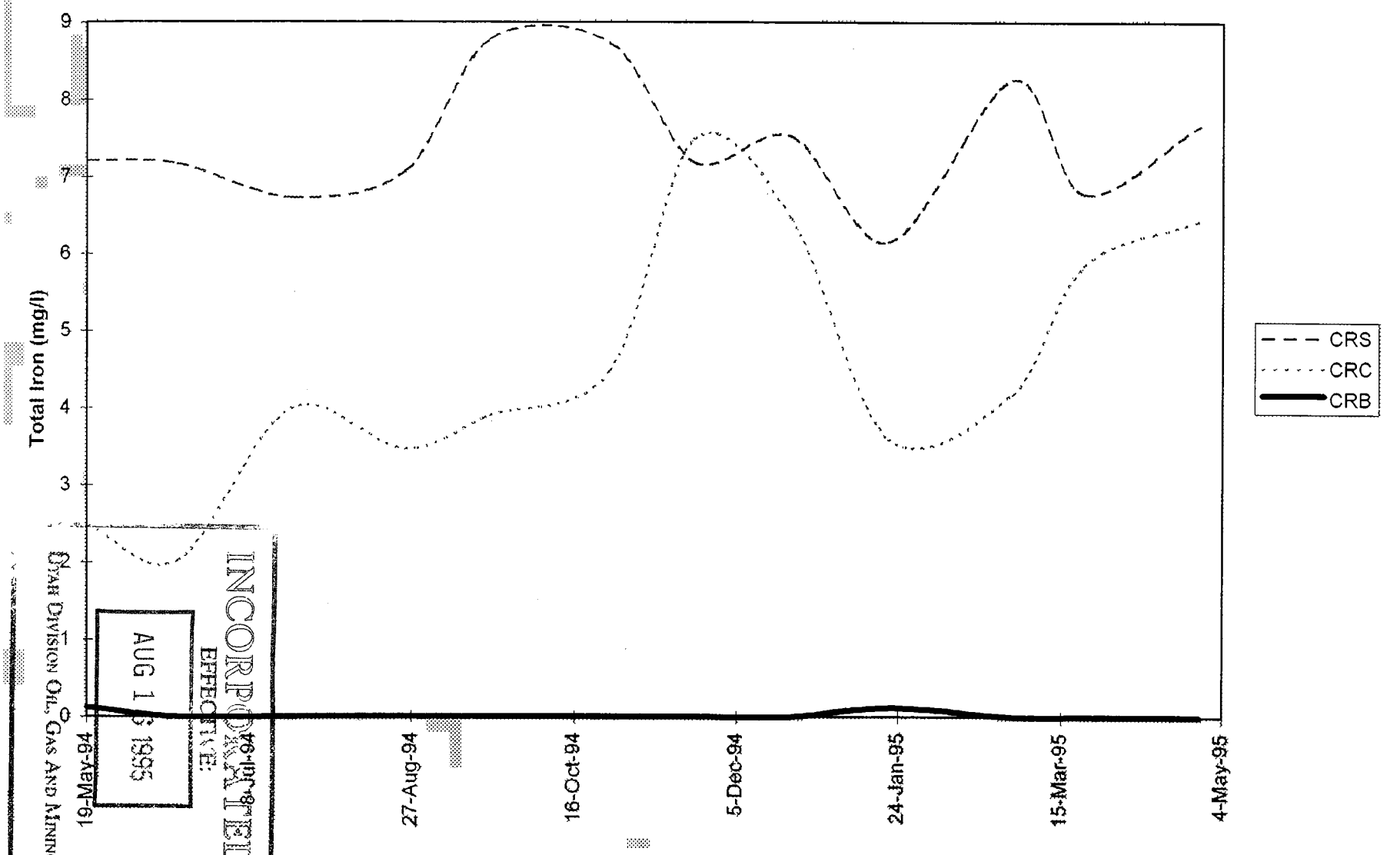
APPENDIX 7-4 FIGURE 18

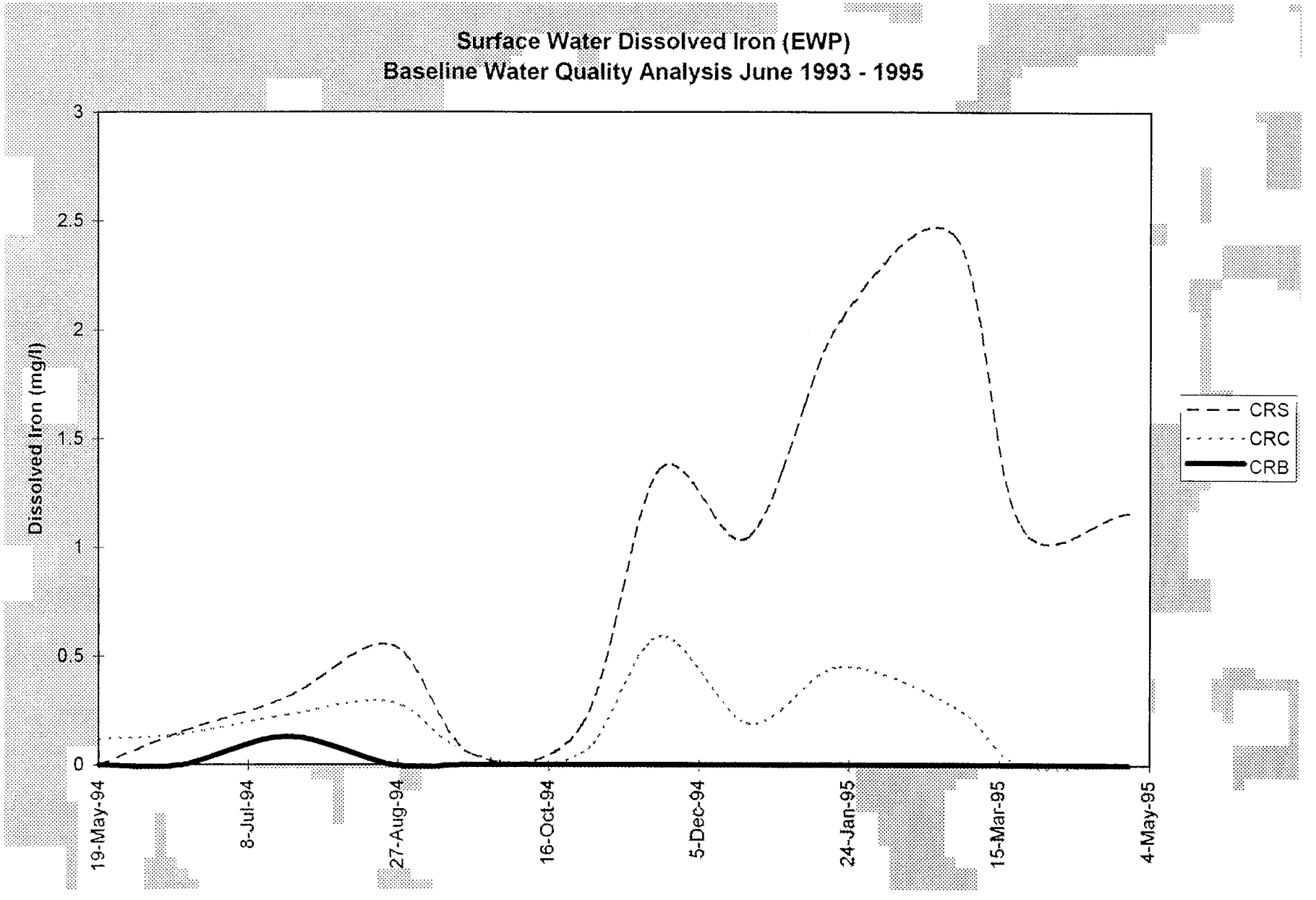


Eckhoff, Watson and Preator Engineering
HUNT-LAB.XLS boron-other 8/9/95

APPENDIX 7-4 FIGURE 19

Surface Water Total Iron (EWP)
Baseline Water Quality Analysis June 1993 - 1995

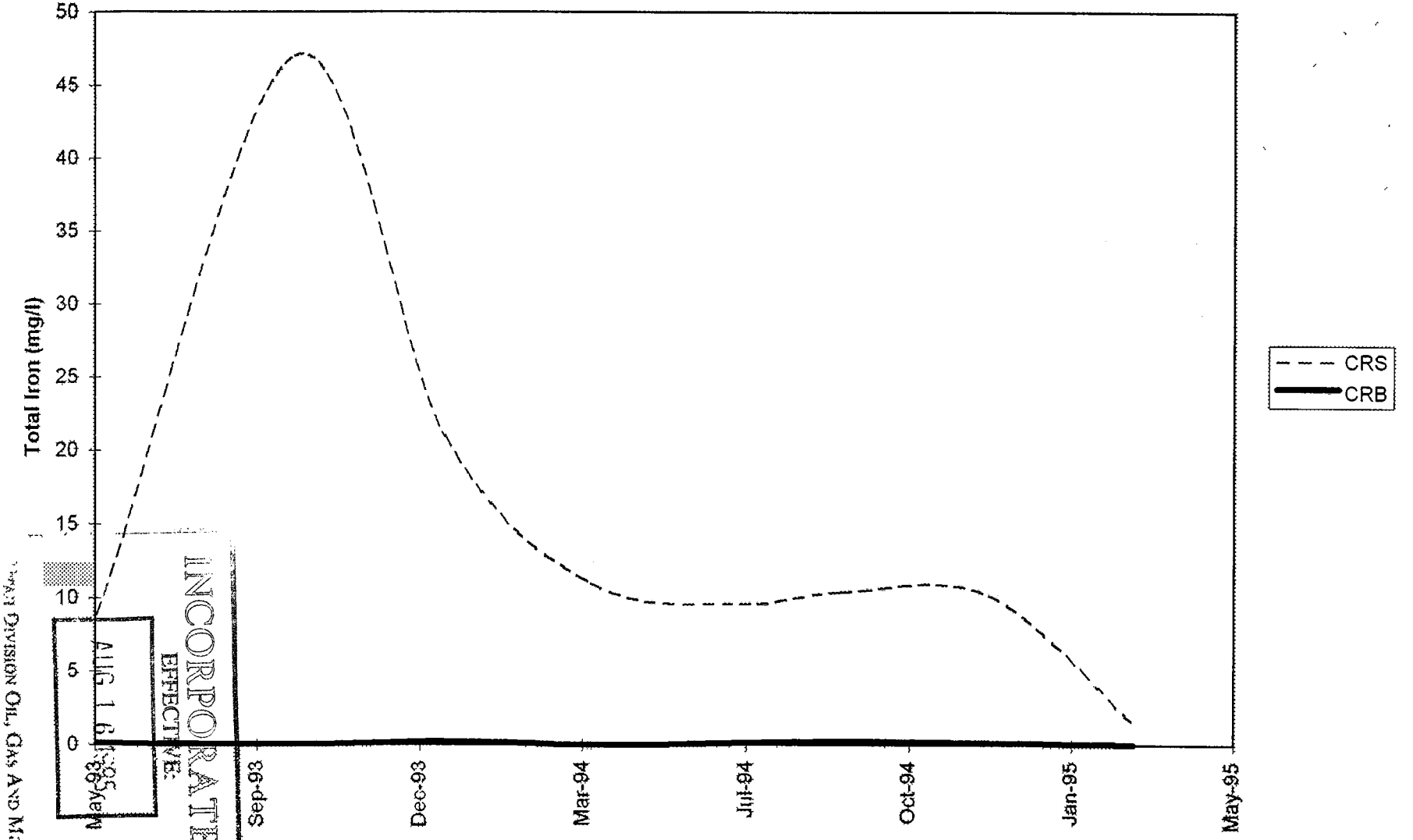


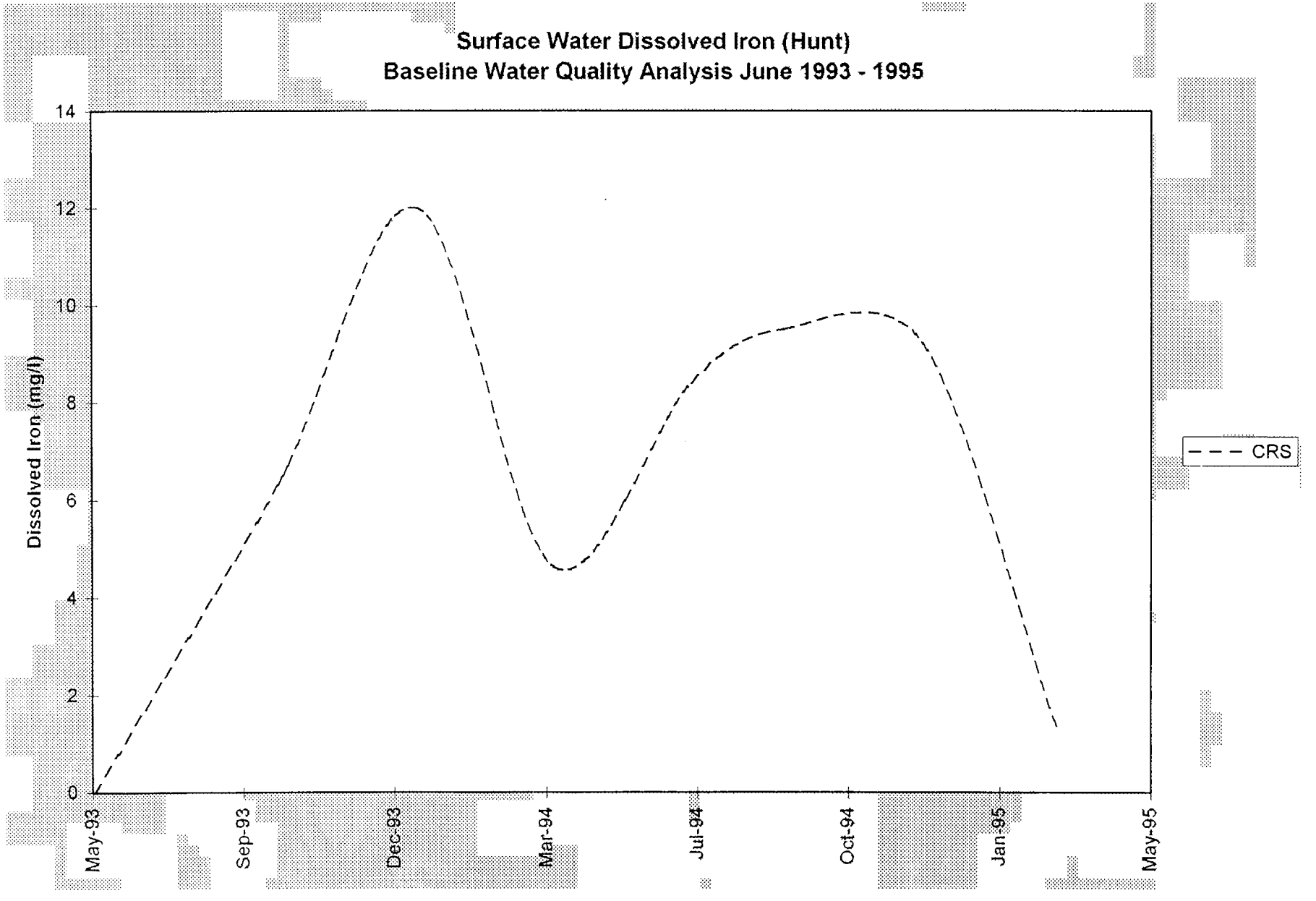


Eckhoff, Watson and Preator Engineering
EWP-LAB.XLS d-iron 8/9/95

APPENDIX 7-4 FIGURE 21

Surface Water Total Iron (Hunt)
Baseline Water Quality Analysis June 1993 - 1995





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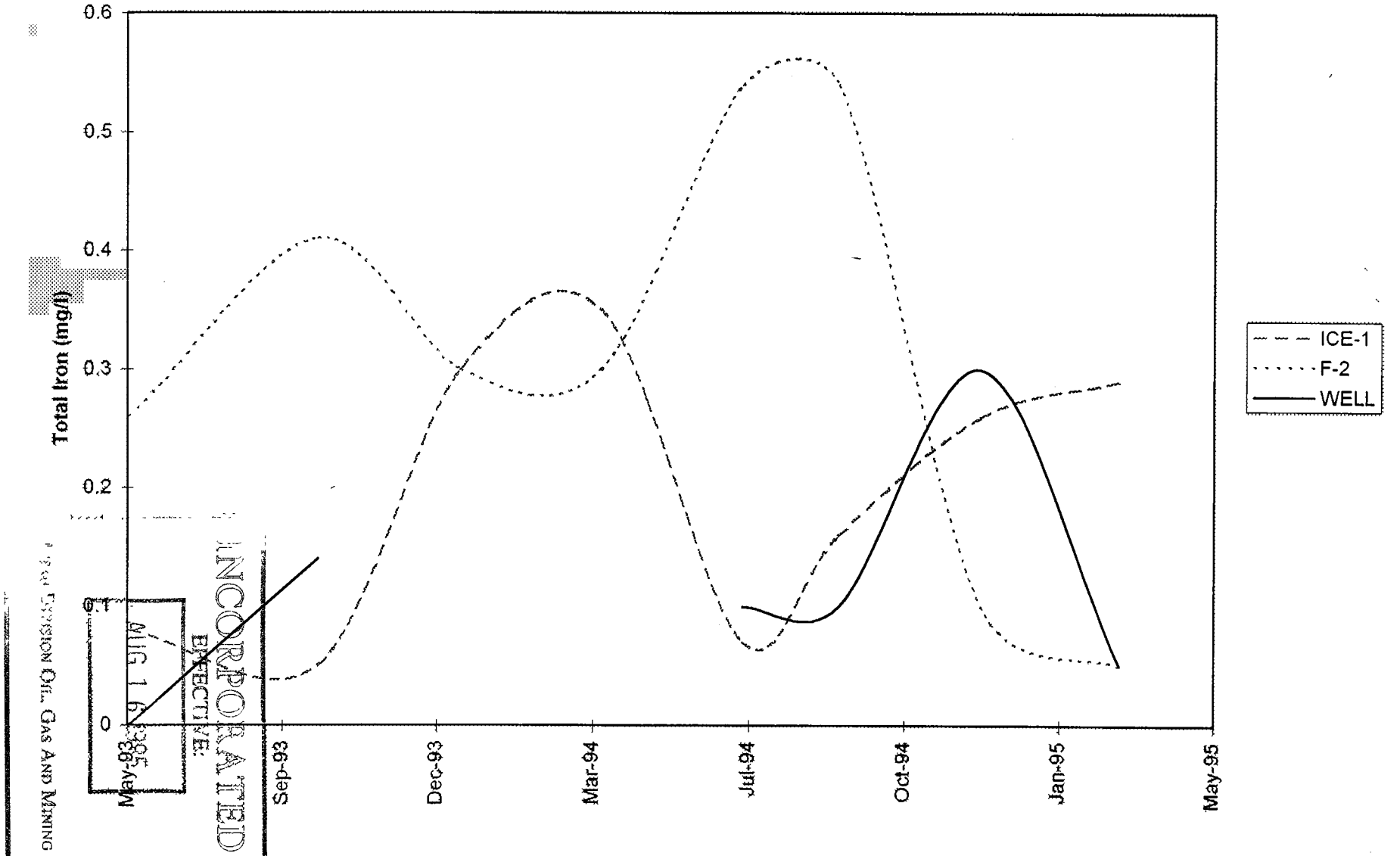
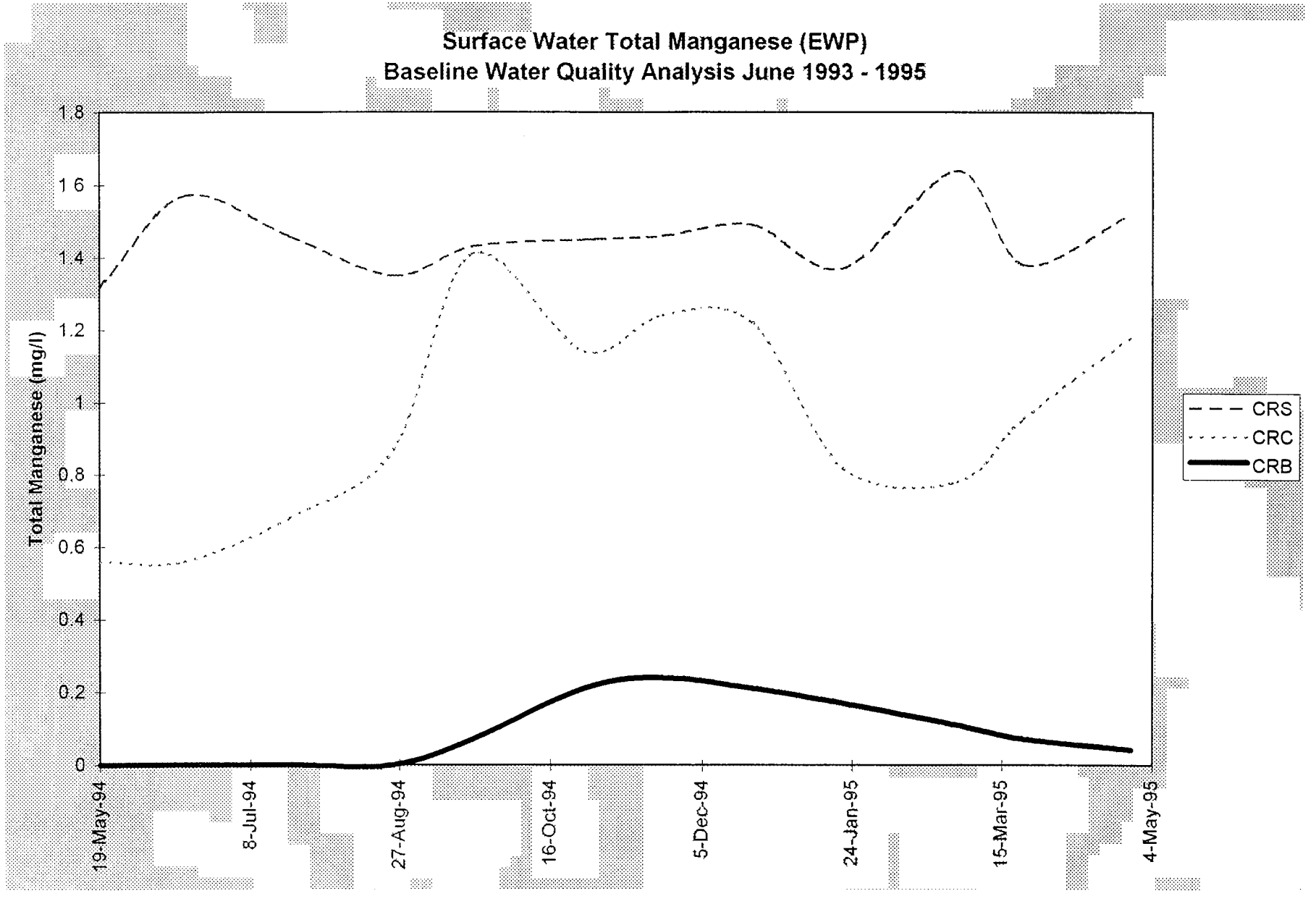
HUNT-LAB.XLS DIron-seep 8/9/95

APPENDIX 7-4 FIGURE 22A

Surface and Ground Water Total Iron (Hunt)
Baseline Water Quality Analysis June 1993 - 1995

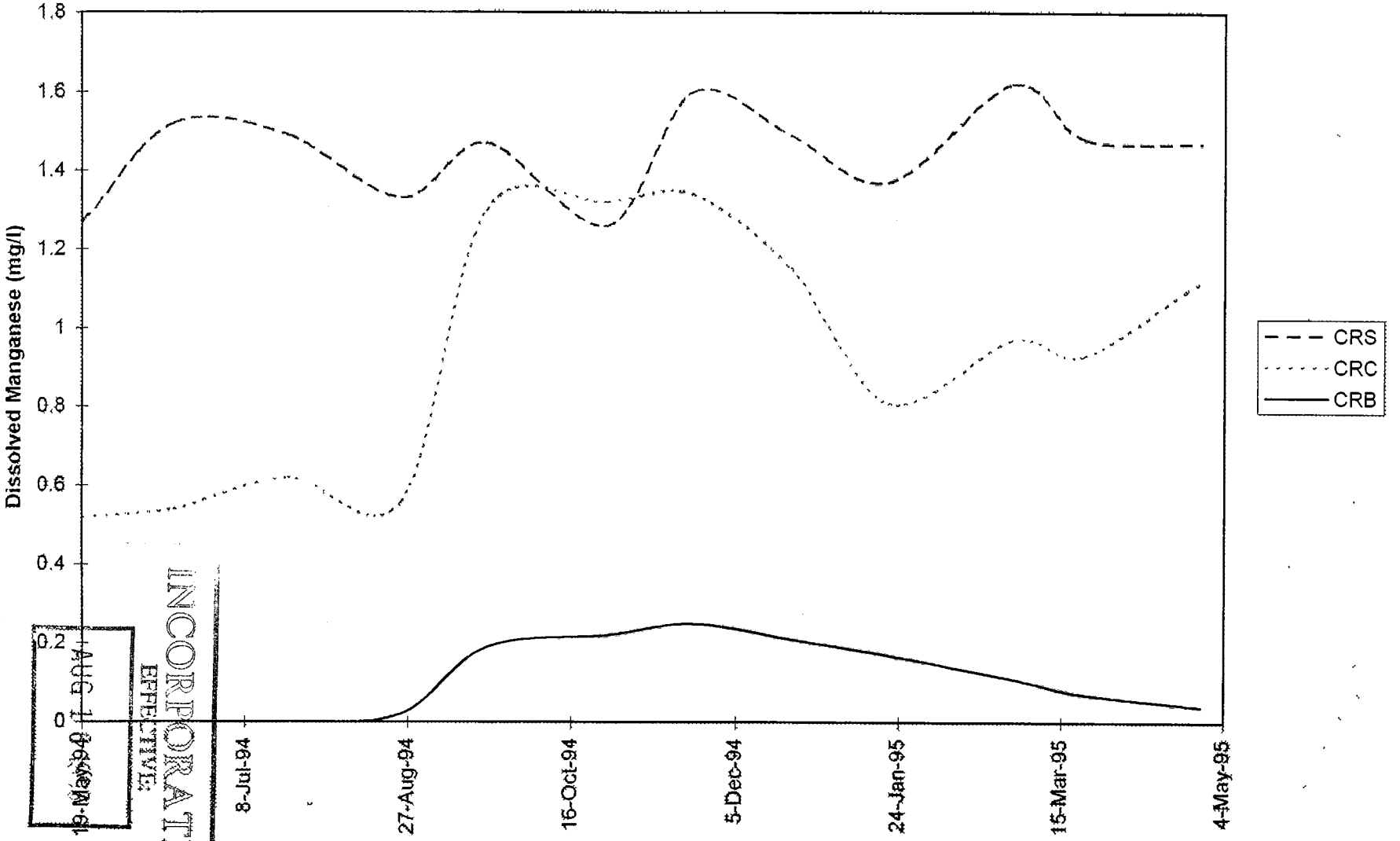




Eckhoff, Watson and Preator Engineering
EWP-LAB.XLS mang 8/9/95

APPENDIX 7-4 FIGURE 24

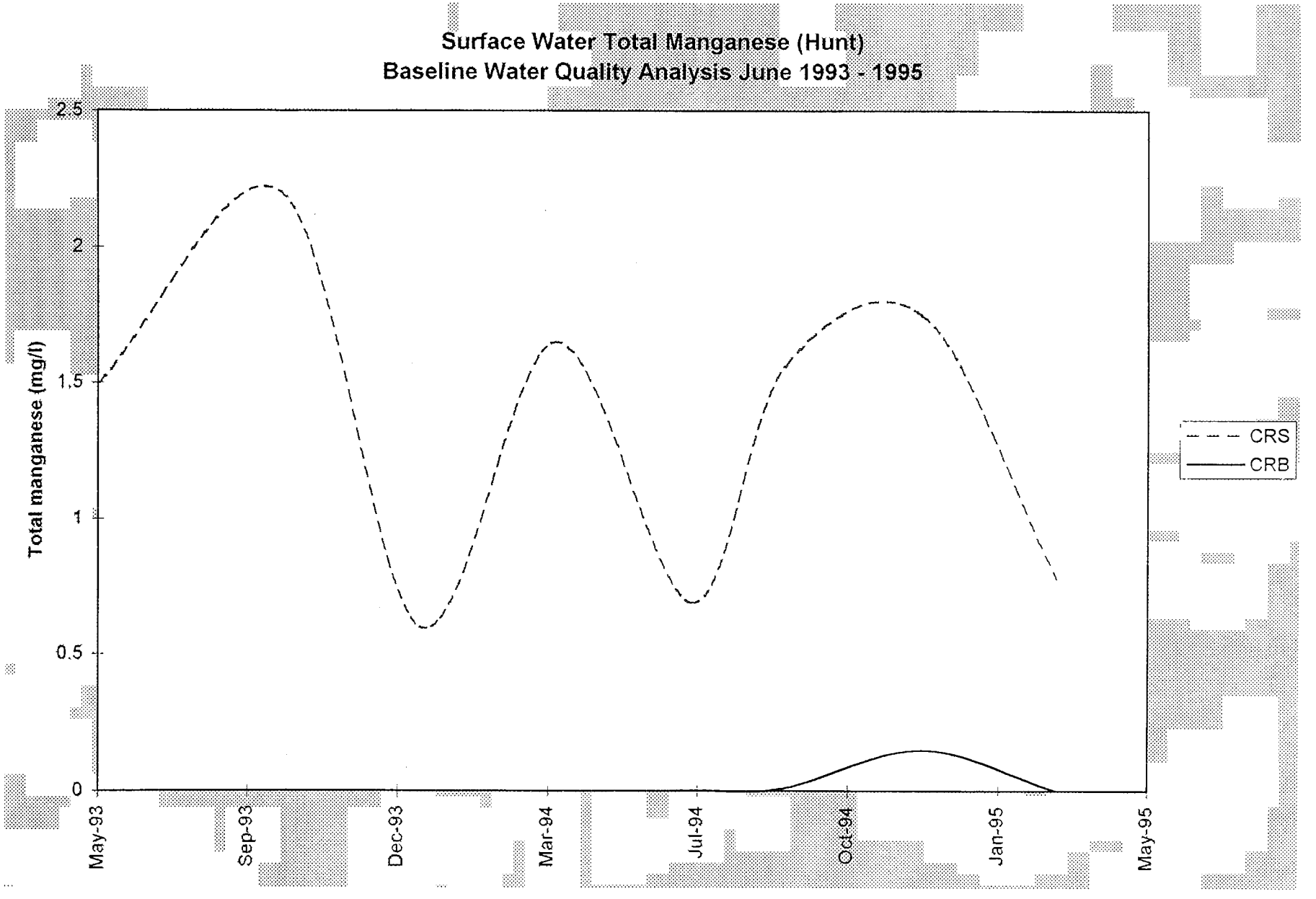
Surface Water Dissolved Manganese (EWP)
Baseline Water Quality Analysis June 1993 - 1995



Eckhoff, Watson and Preator Engineering

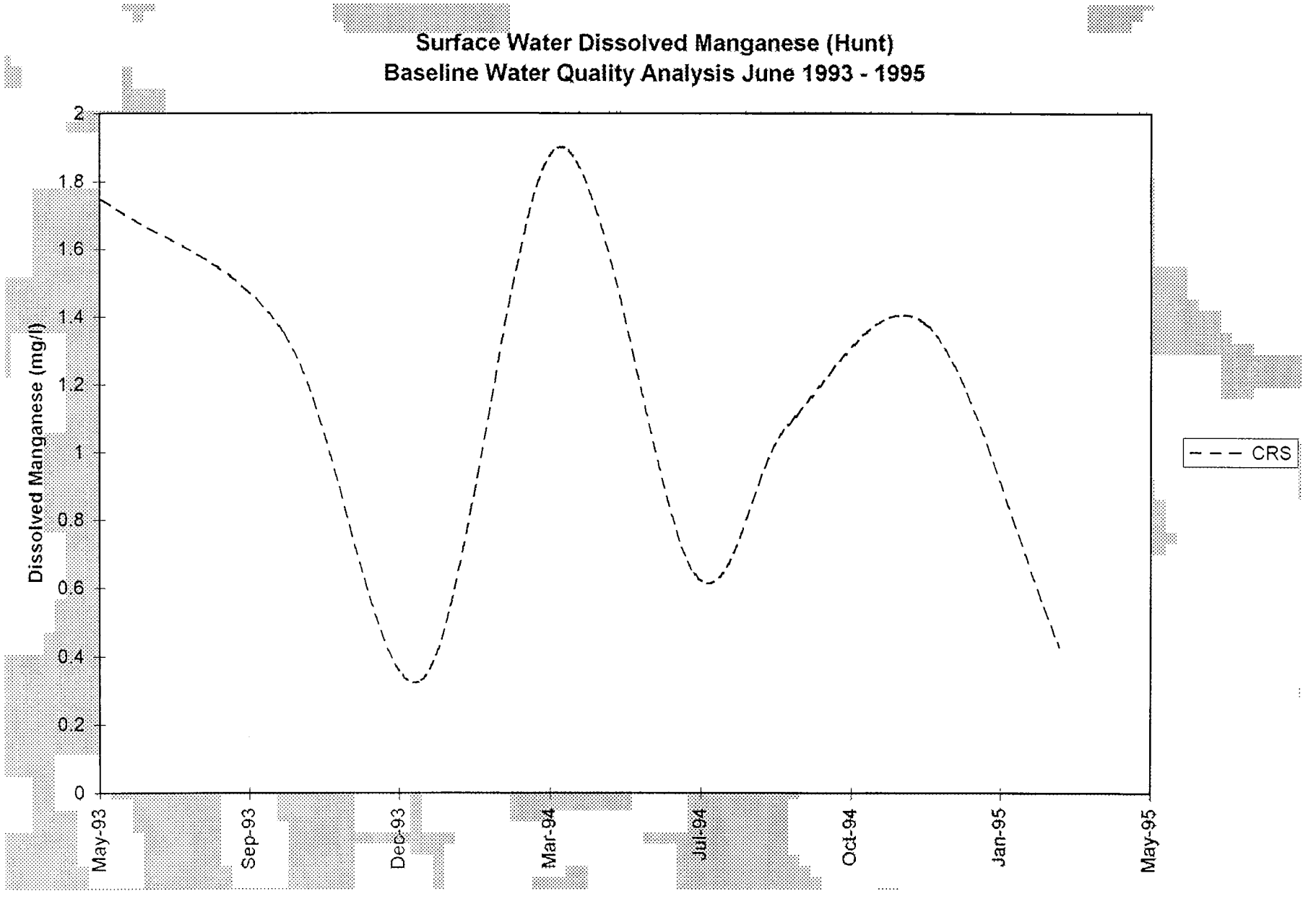
EWP-LAB.XLS d-mang 8/9/95

APPENDIX 7-4 FIGURE 25



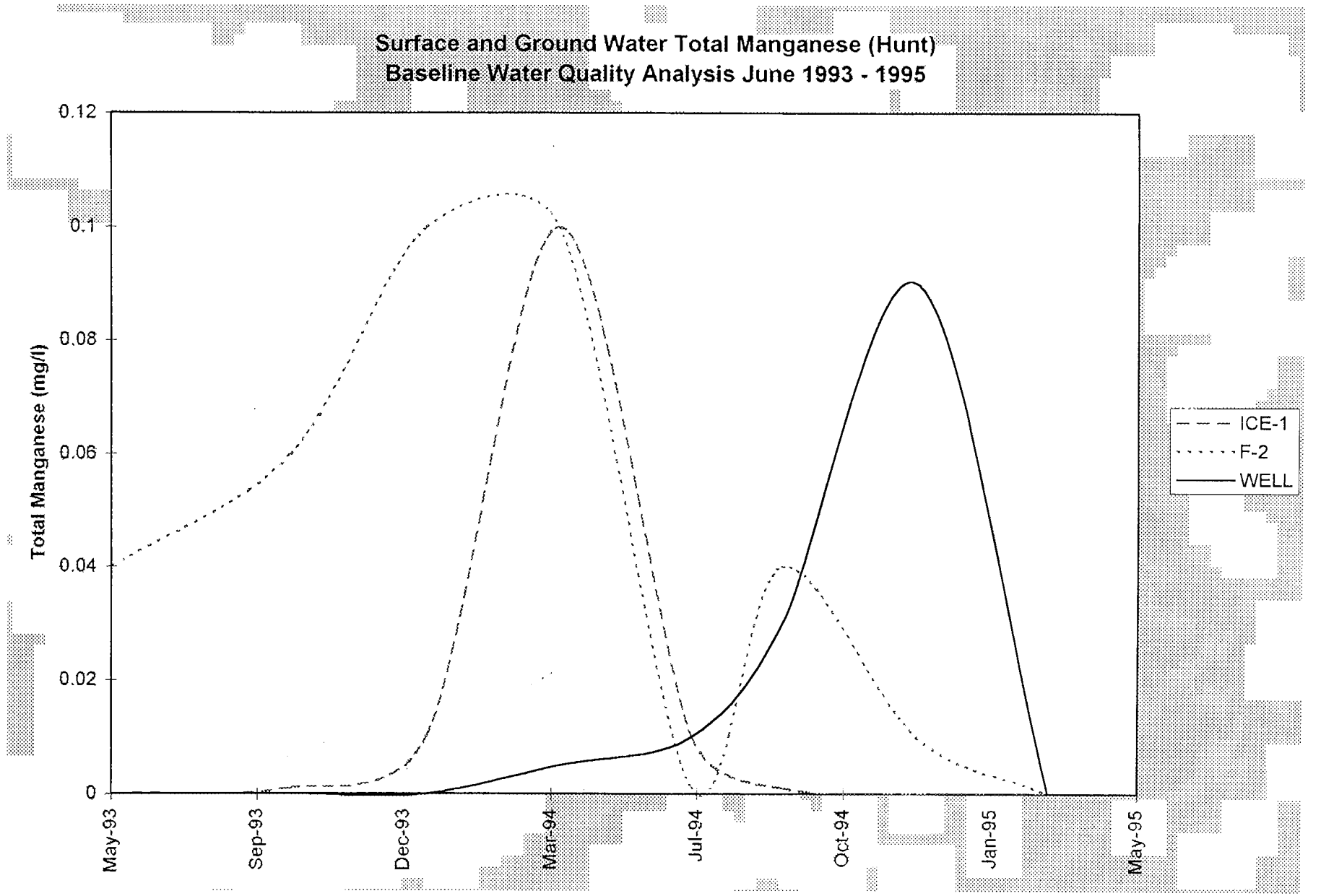
Eckhoff, Watson and Preator Engineering
HUNT-LAB.XLS Mang-seep 8/15/95

APPENDIX 7-4 FIGURE 26



Eckhoff, Watson and Preator Engineering
HUNT-LAB.XLS DMang-seep 8/9/95

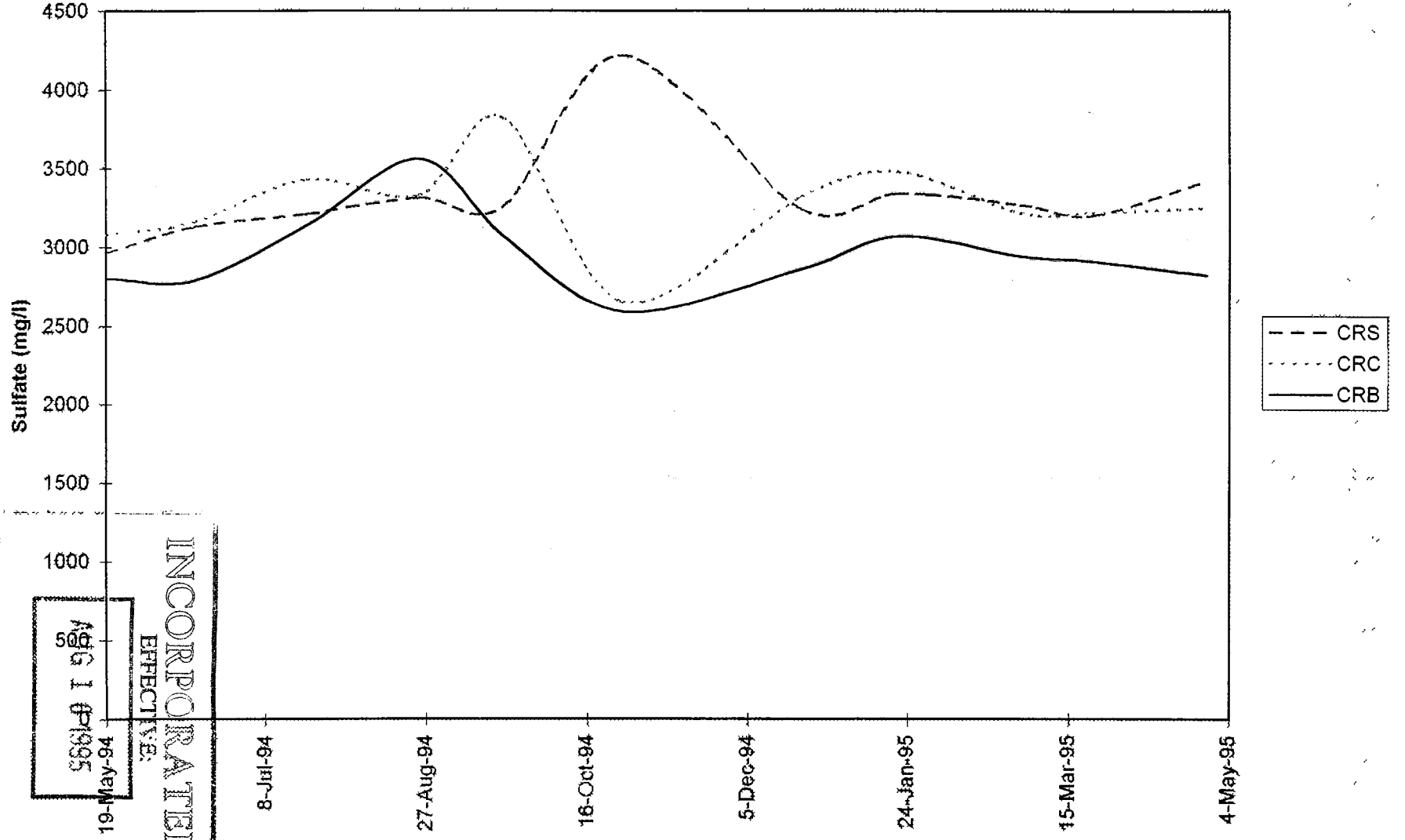
APPENDIX 7-4 FIGURE 26A



Eckhoff, Watson and Preator Engineering
HUNT-LAB.XLS mang-other 8/15/95

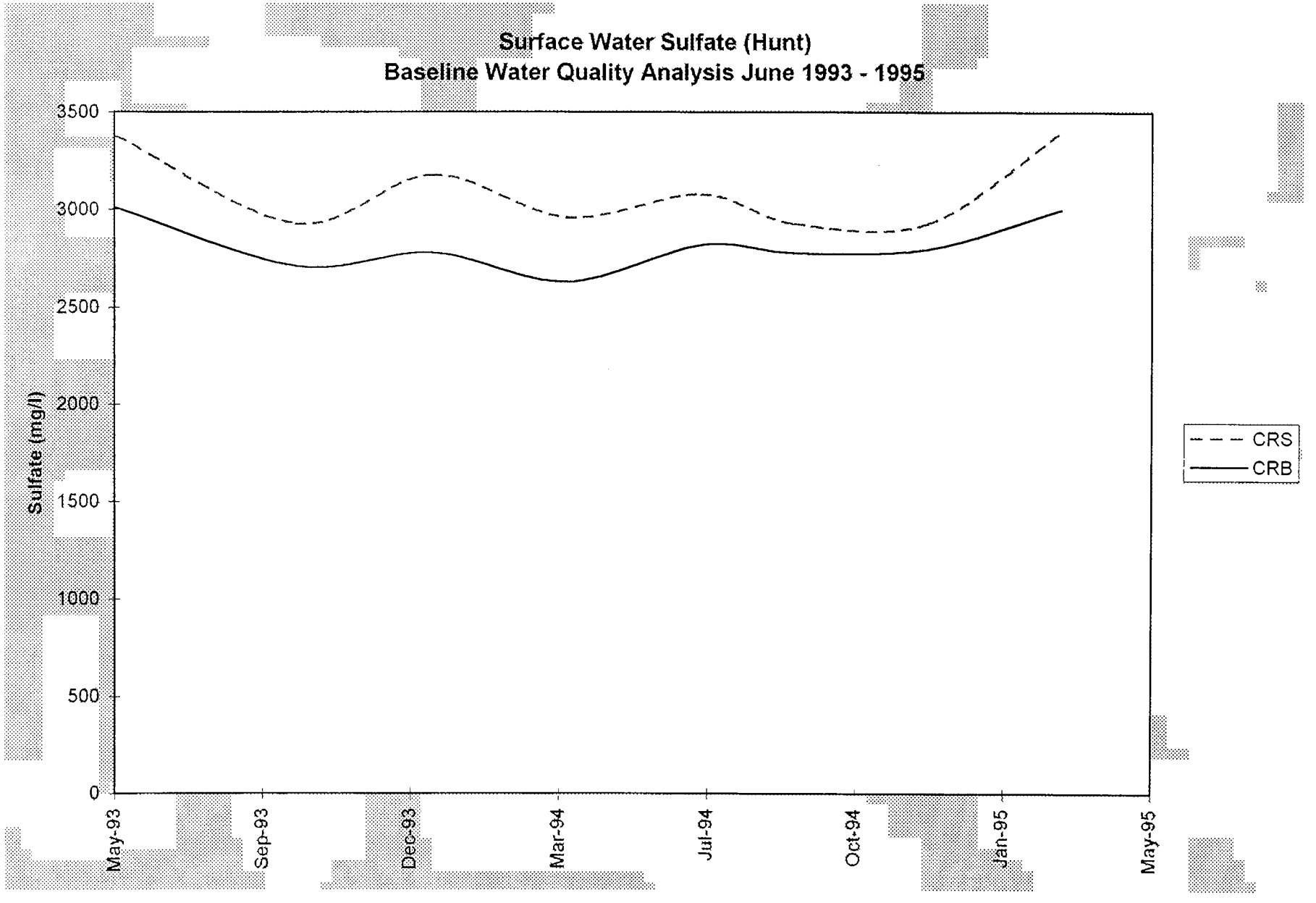
APPENDIX 7-4 FIGURE 27

Surface Water Sulfate (EWP)
Baseline Water Quality Analysis June 1993 - 1995



Eckhoff, Watson and Preator Engineering
EWP-LAB.XLS sulfate 8/9/95

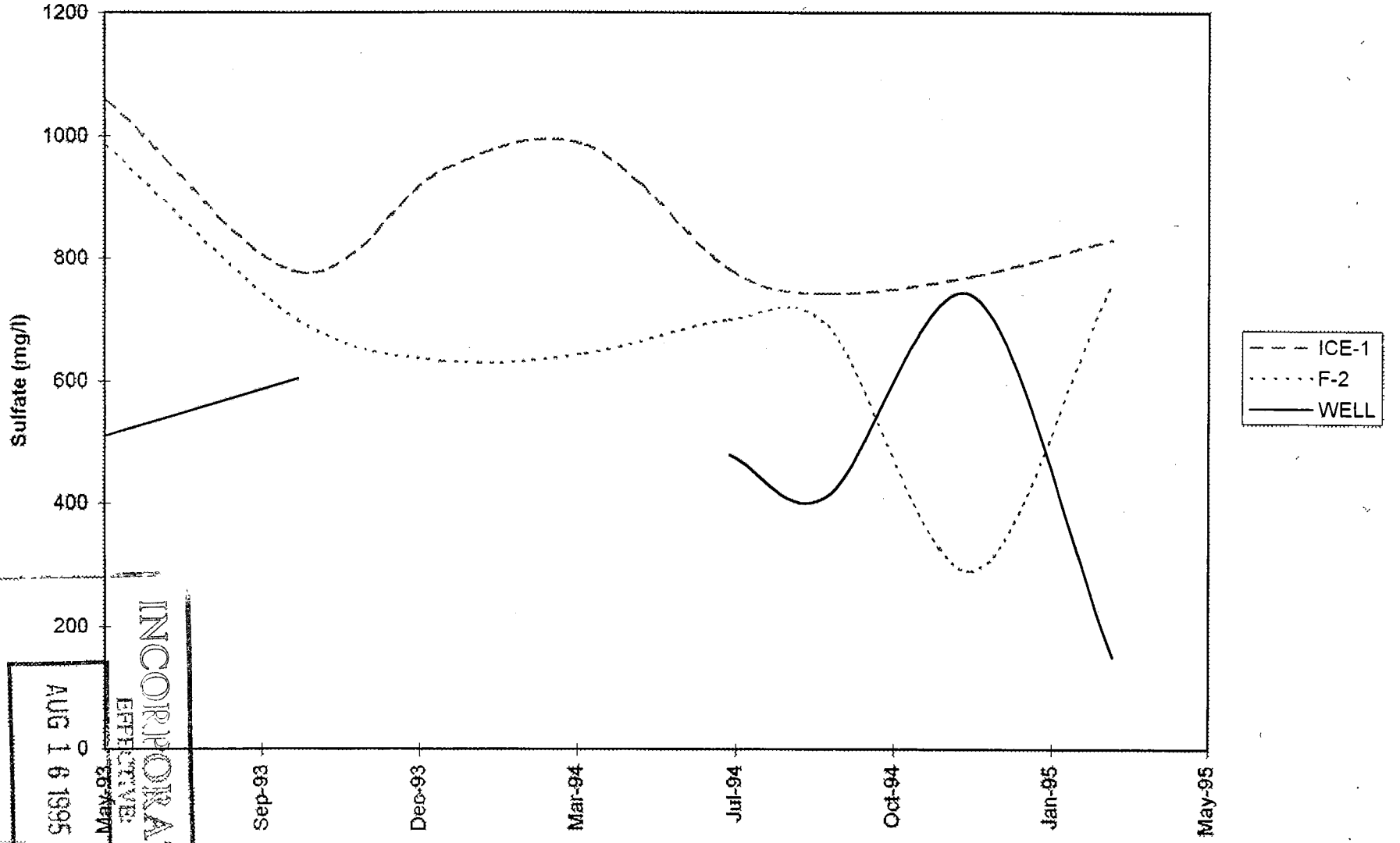
APPENDIX 7-4 FIGURE 28



Eckhoff, Watson and Preator Engineering
HUNT-LAB.XLS sul-seep 8/9/95

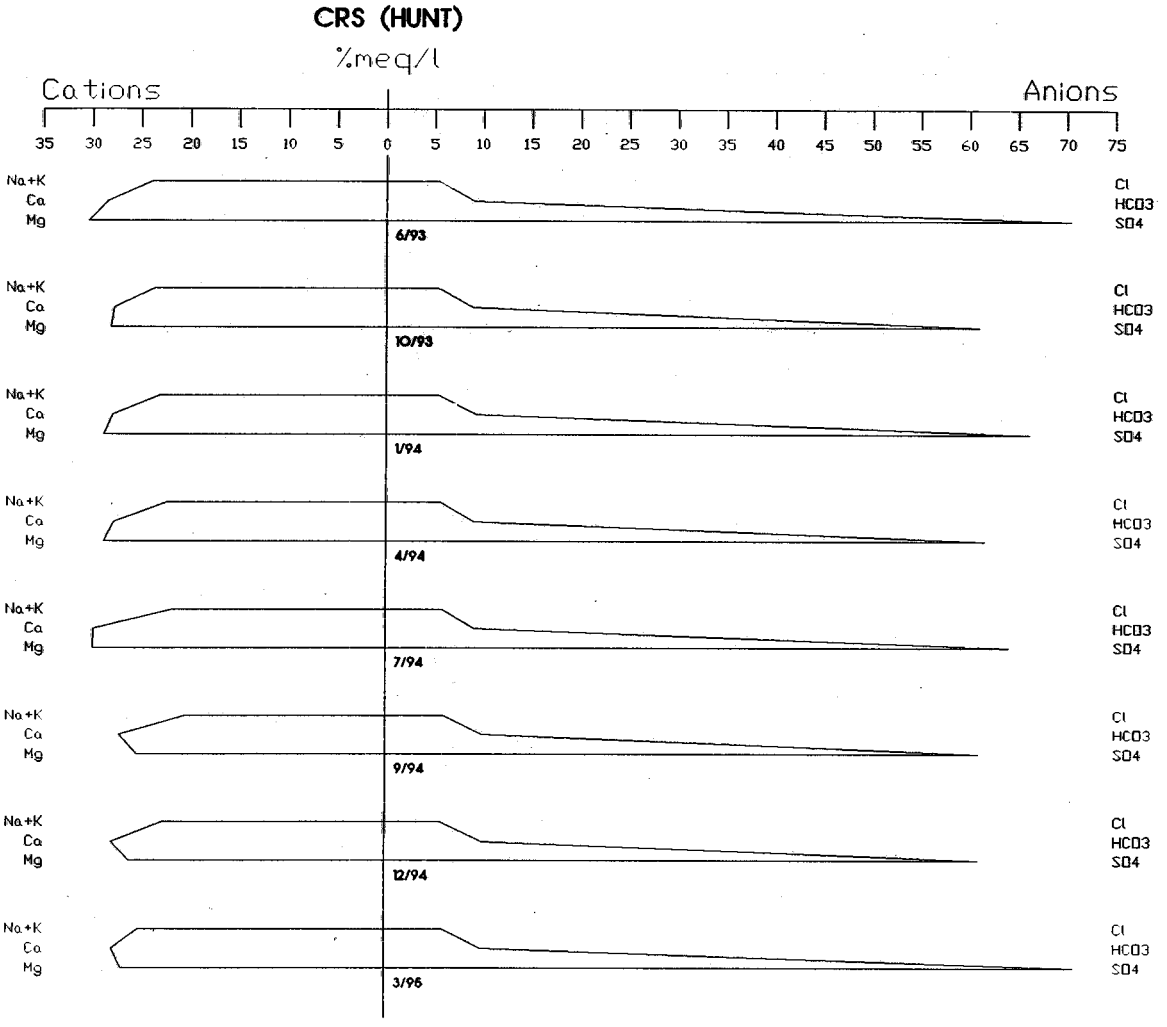
APPENDIX 7-4 FIGURE 29

Surface and Ground Water Sulfate (Hunt)
Baseline Water Quality Analysis June 1993 - 1995



Eckhoff, Watson and Preator Engineering
HUNT-LAB XLS sul-other 8/9/95

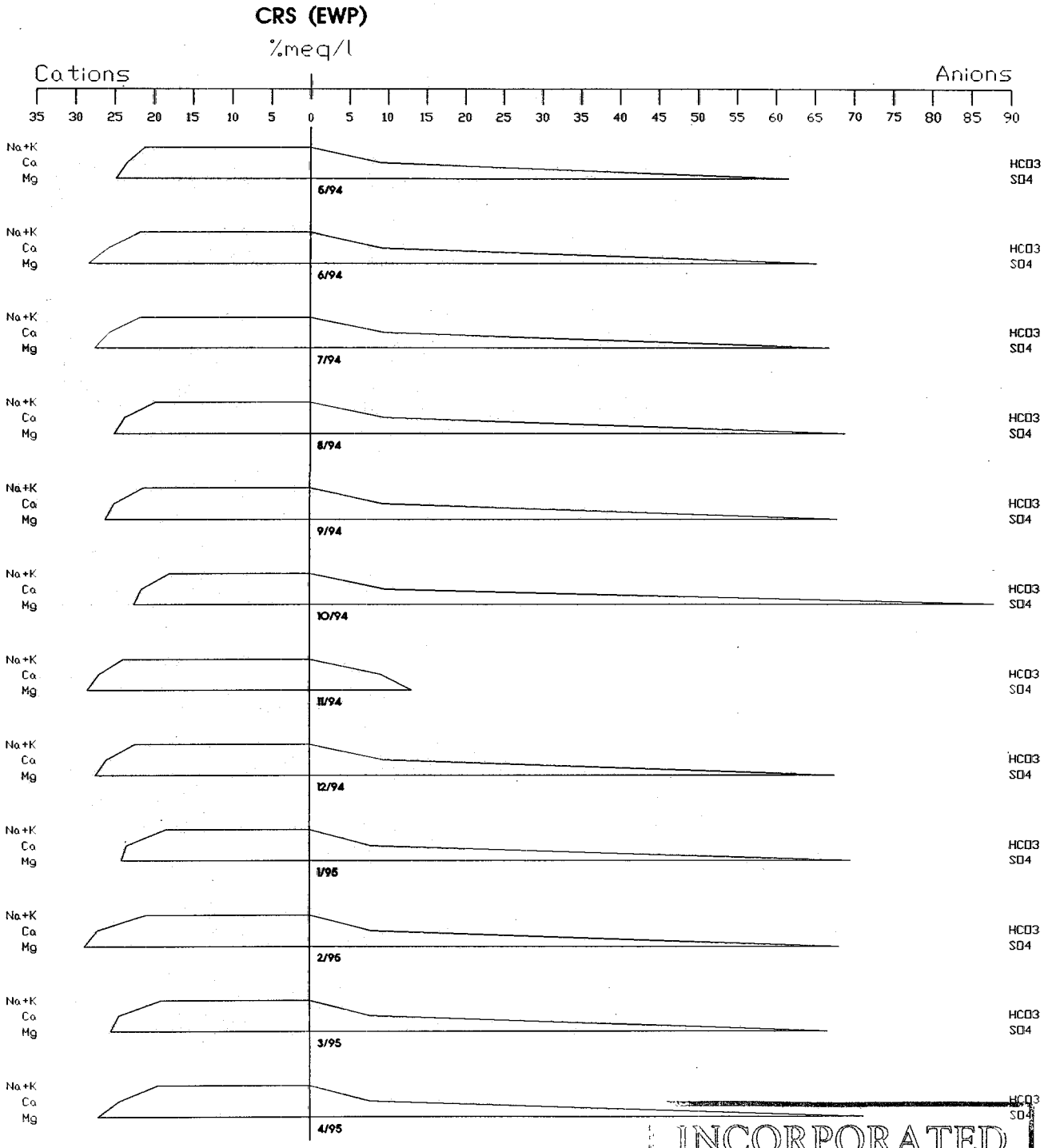
APPENDIX 7-4 FIGURE 30



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 31

SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis, June 1993-1995

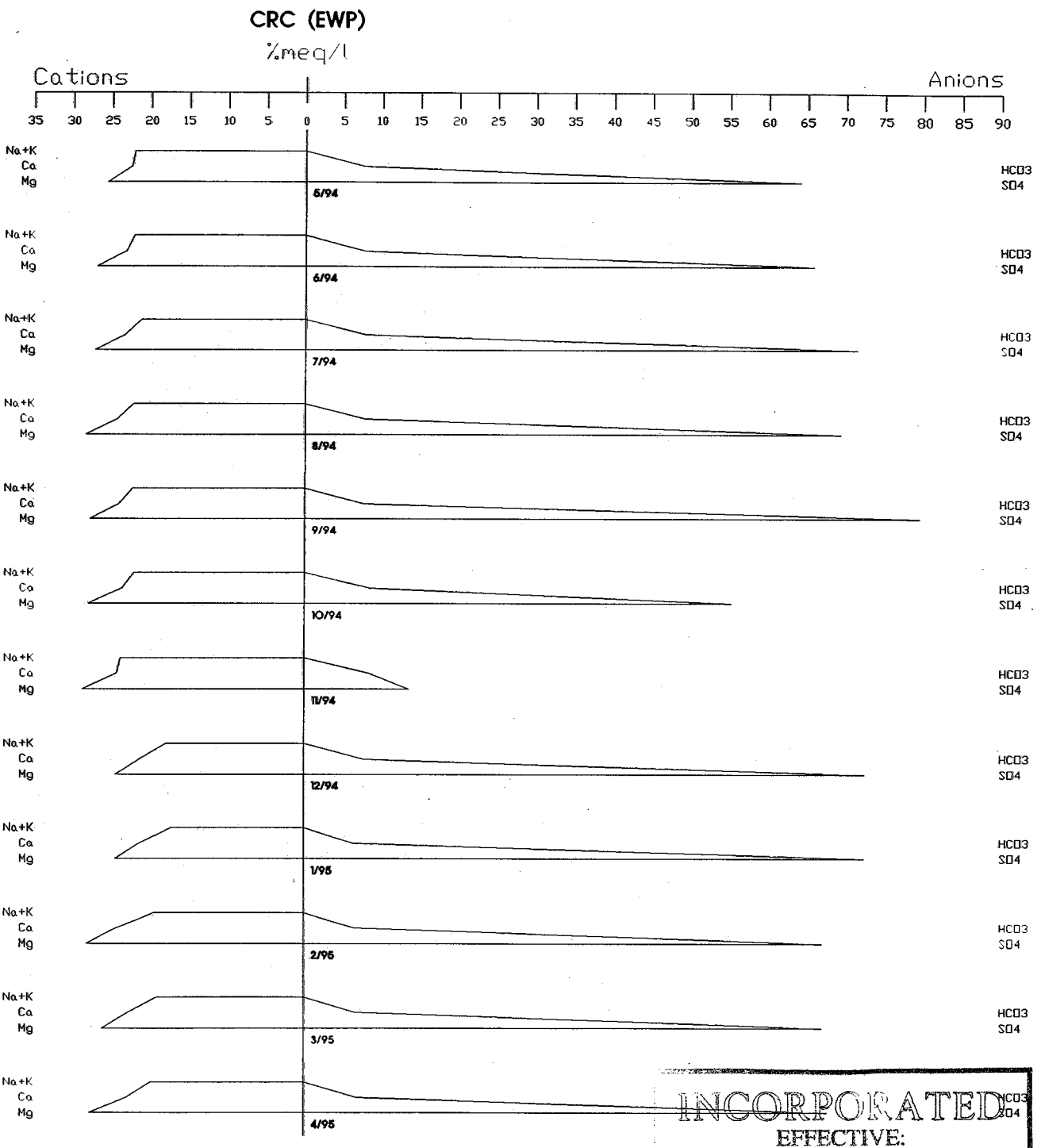


INCORPORATED
EFFECTIVE:
AUG 16 1995

ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 32

SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1990-1995



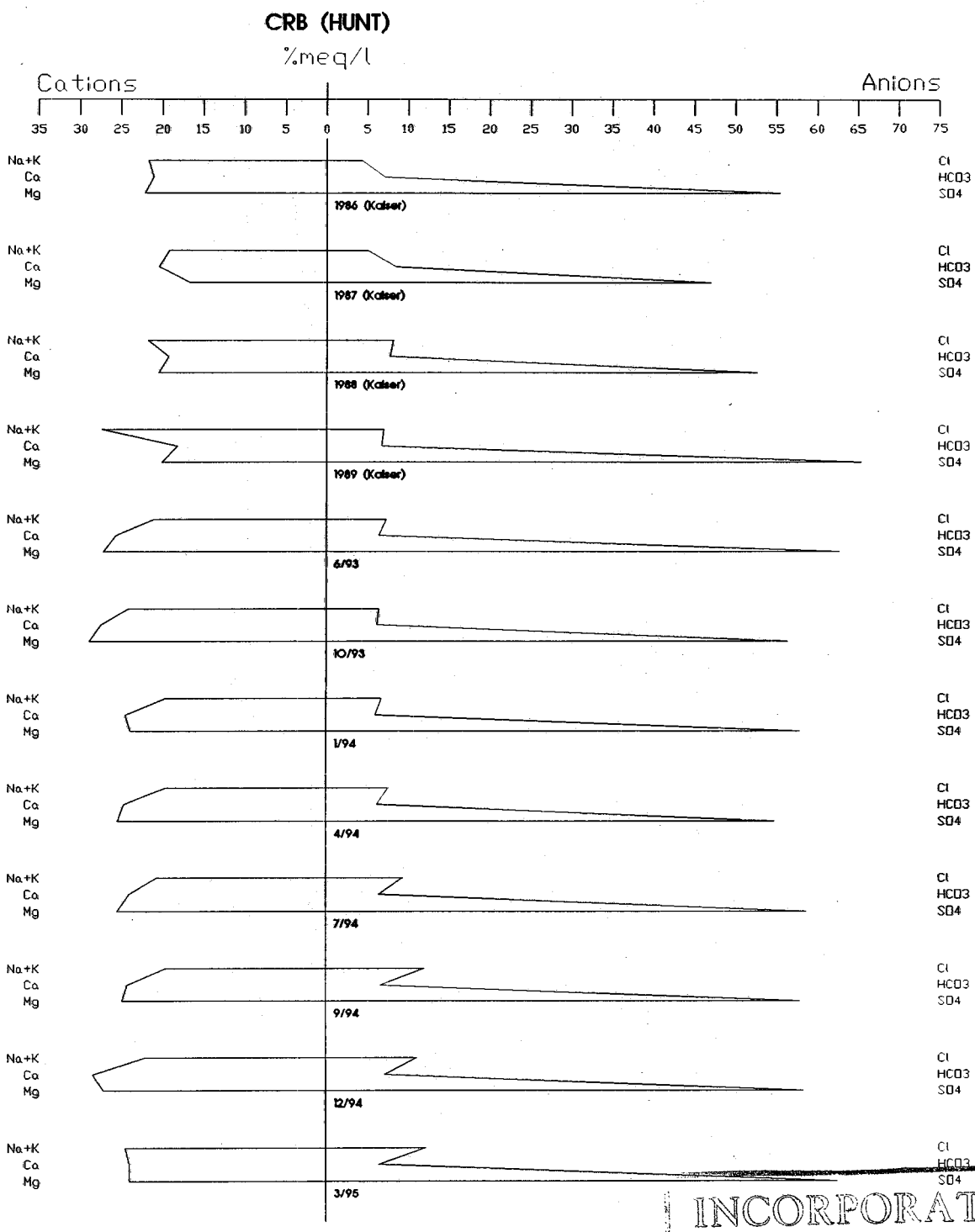
INCORPORATED
EFFECTIVE:
AUG 16 1995

ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 33

SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993-1995

UTAH DIVISION OIL, GAS AND MINING



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 34

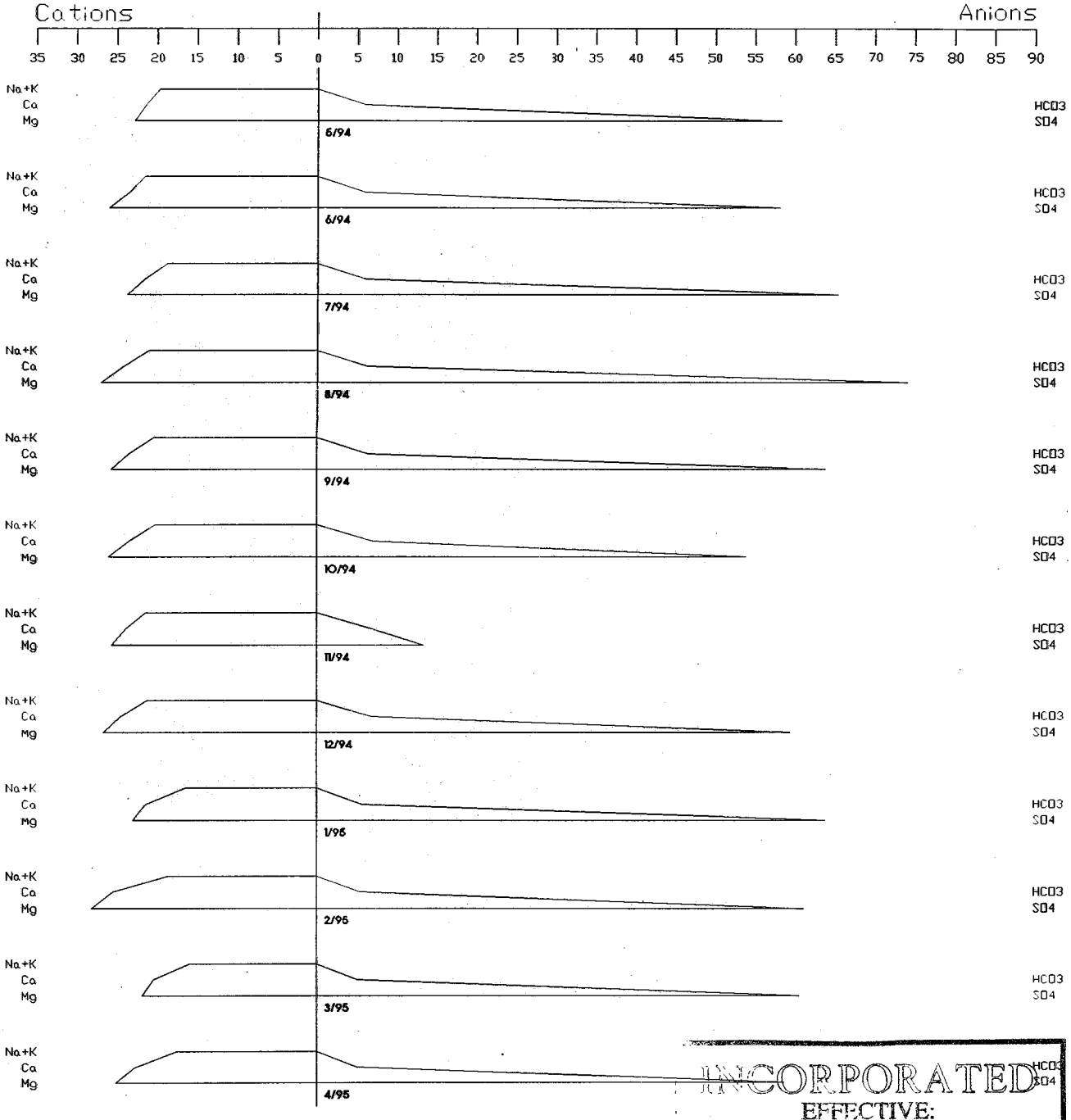
SUNNYSIDE COGENERATION ASSOCIATES

Surface & Ground Water Monitoring Sites

Baseline Water Quality Analysis June 1993-1995

CRB (EWP)

%meq/l

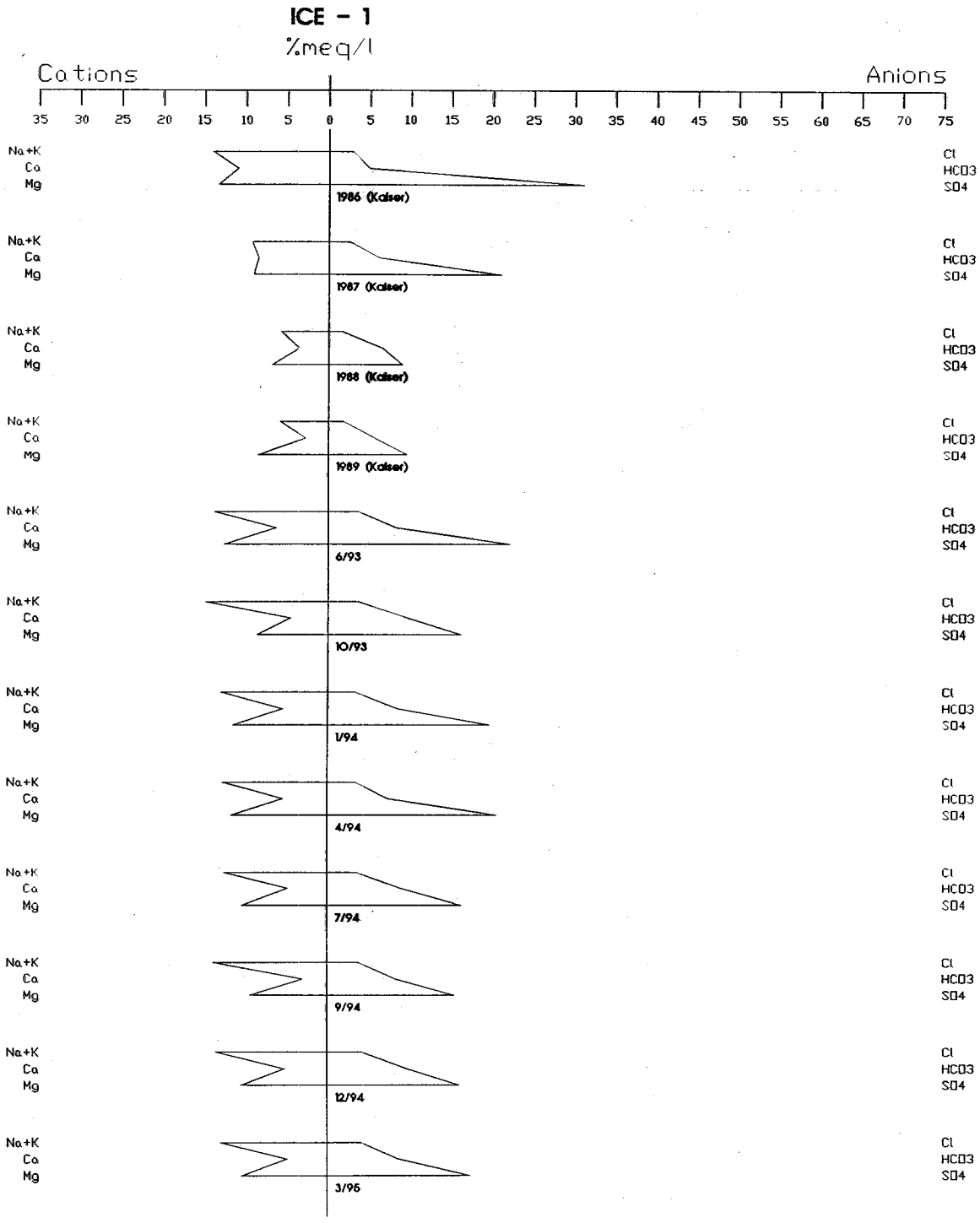


INCORPORATED
EFFECTIVE:
AUG 16 1995

ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 35

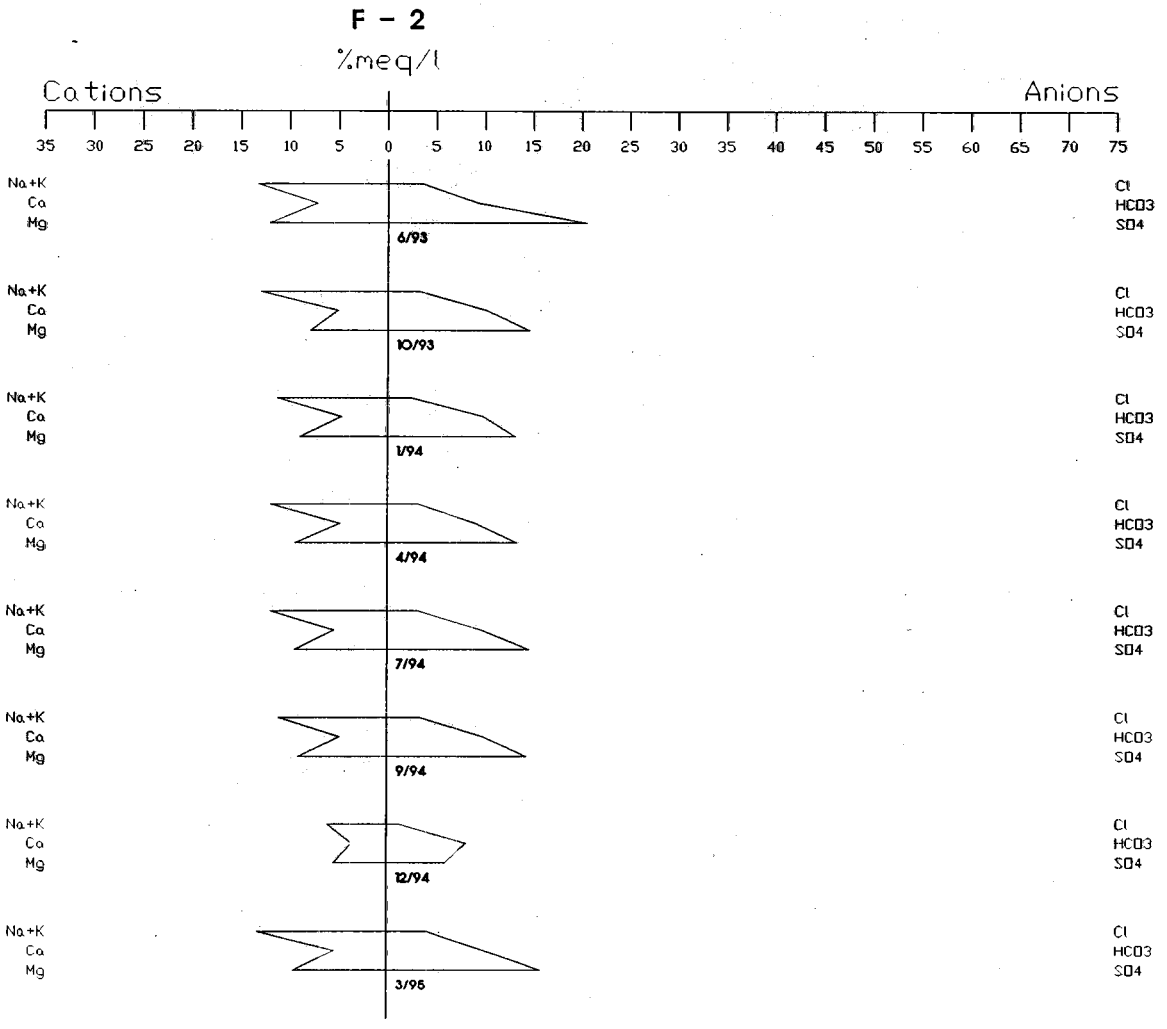
SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993-1995



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 36

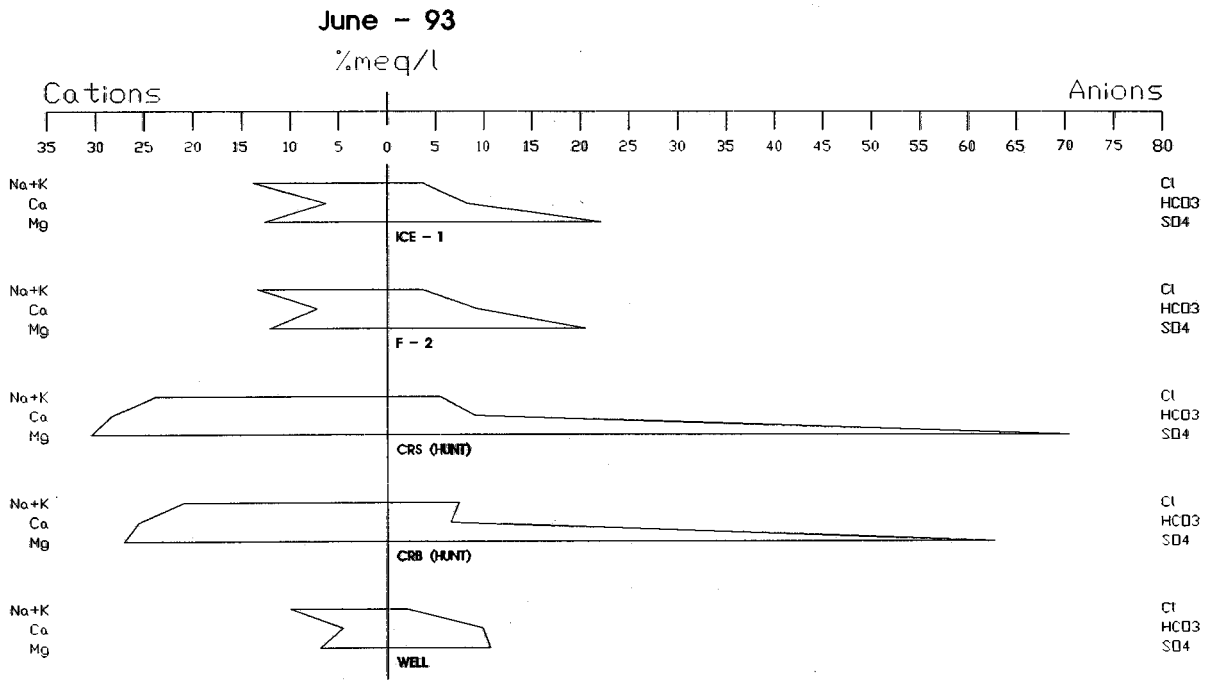
SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993-1995



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 37

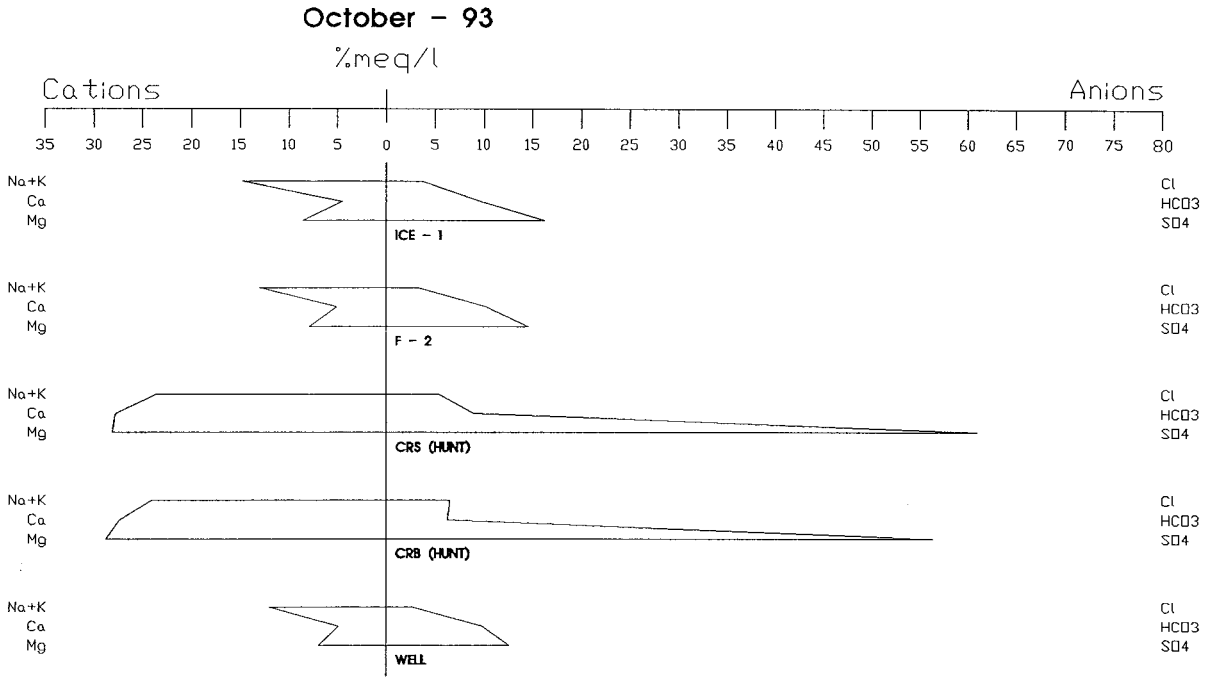
SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993-1995



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 38

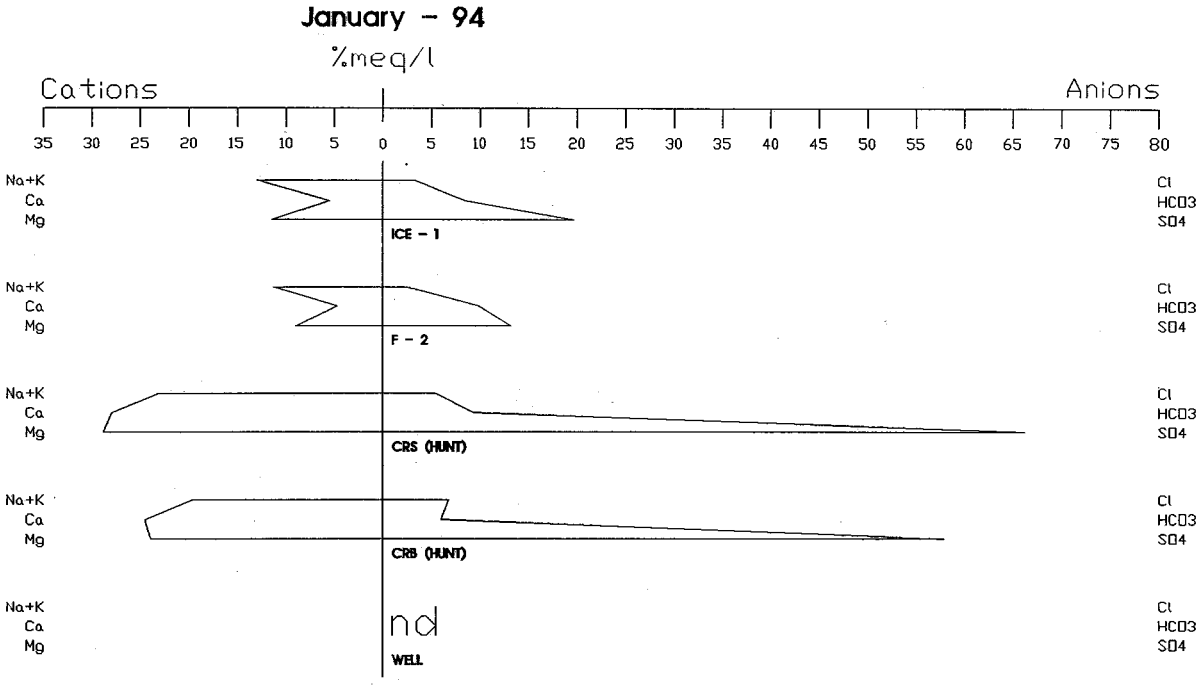
SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993-1995



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 39

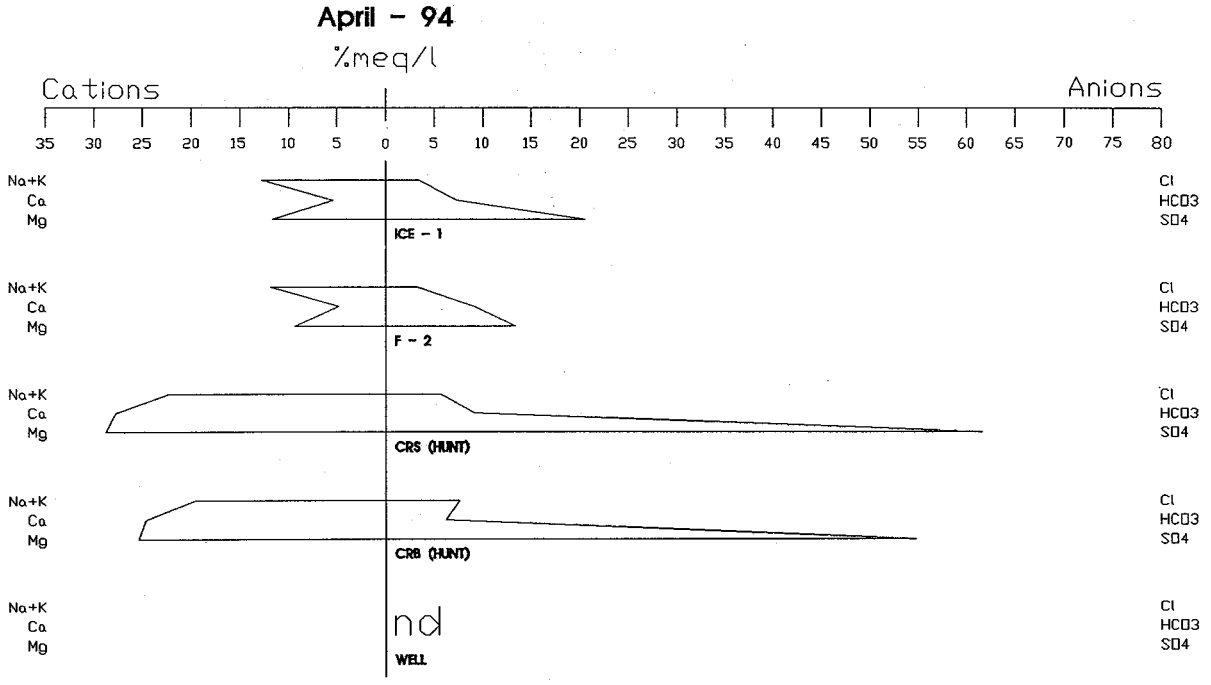
SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993-1995



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 40

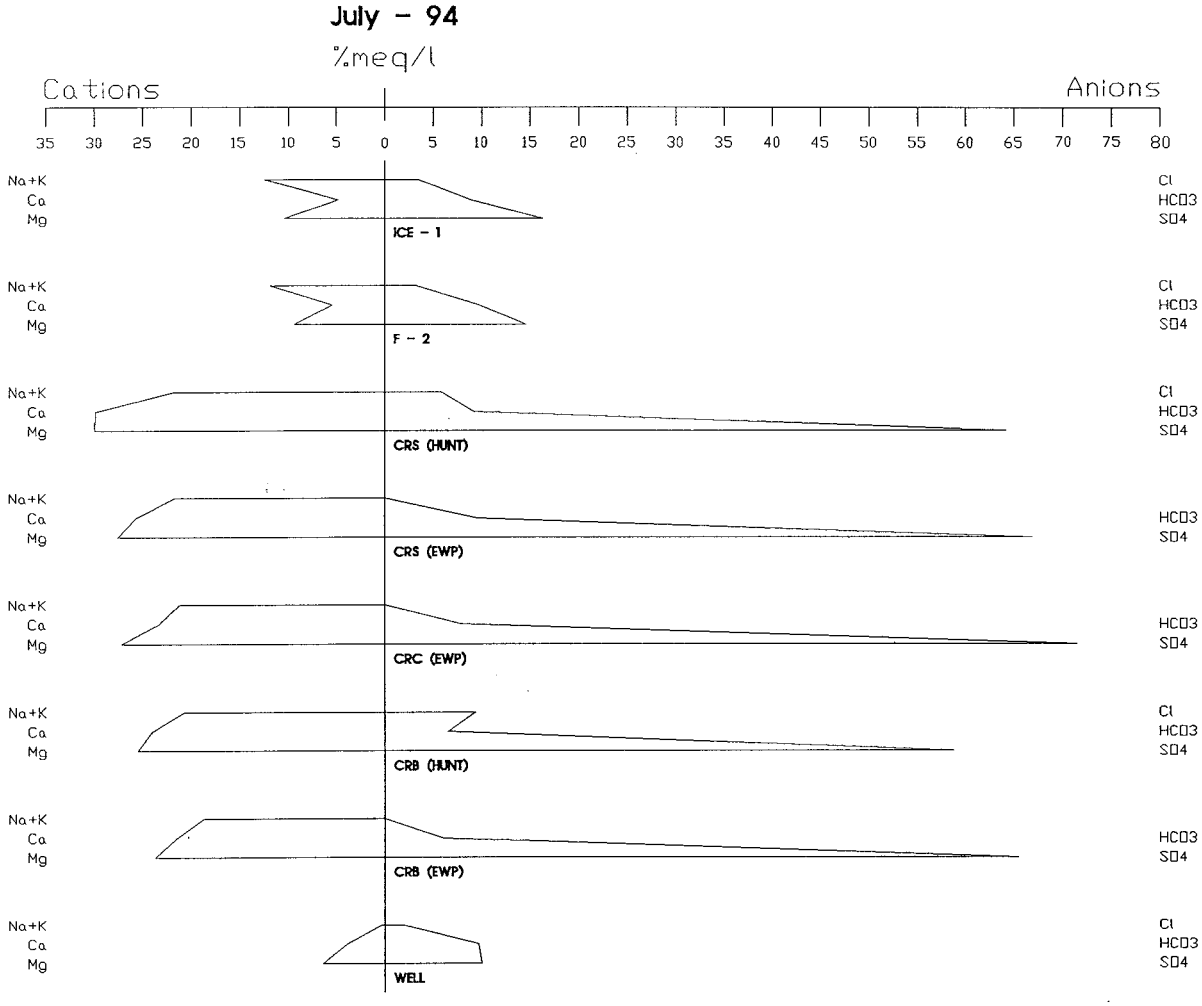
SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993–1995



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 41

SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993–1995

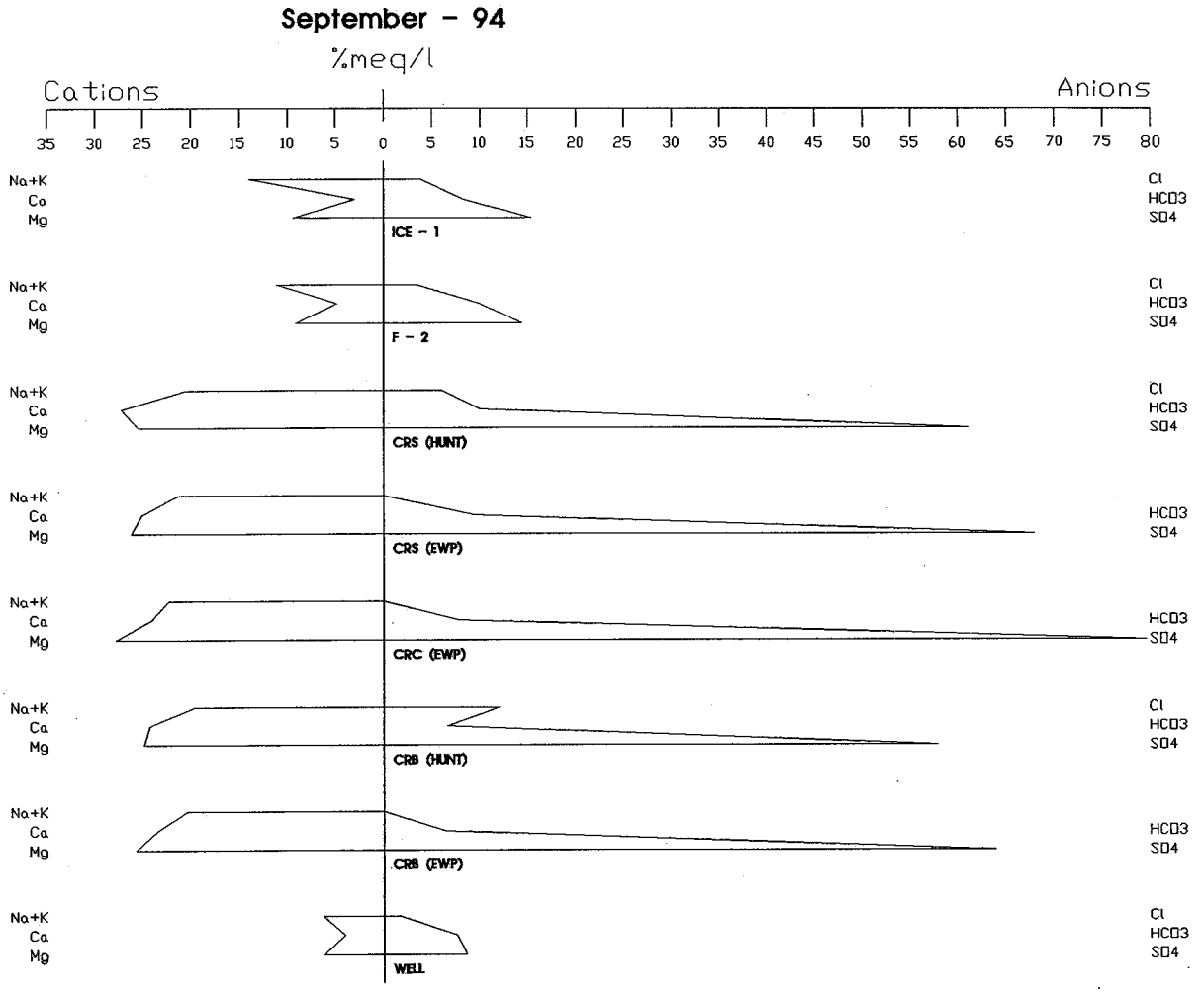


ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 42

SUNNYSIDE COGENERATION ASSOCIATES

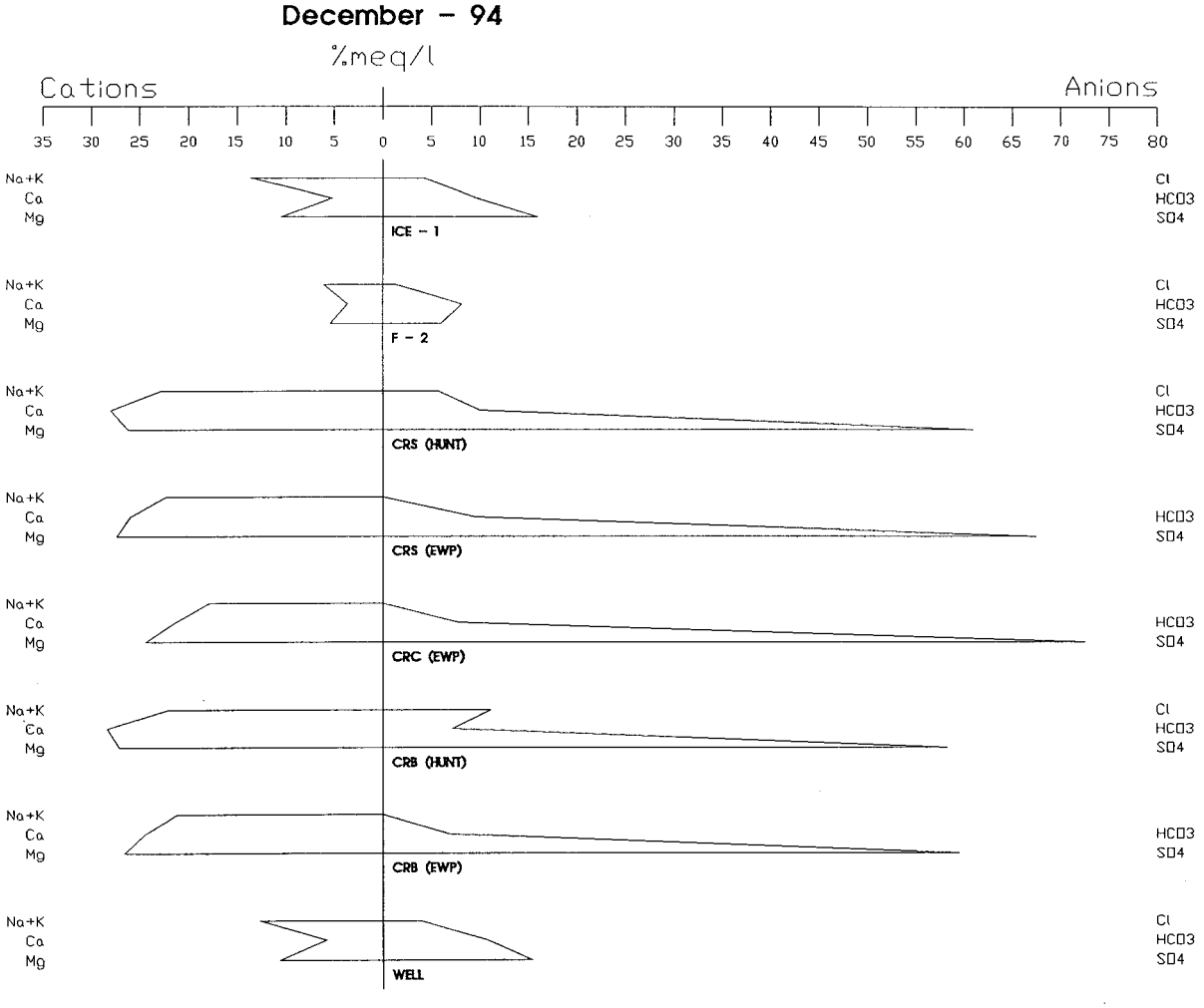
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993–1995



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 43

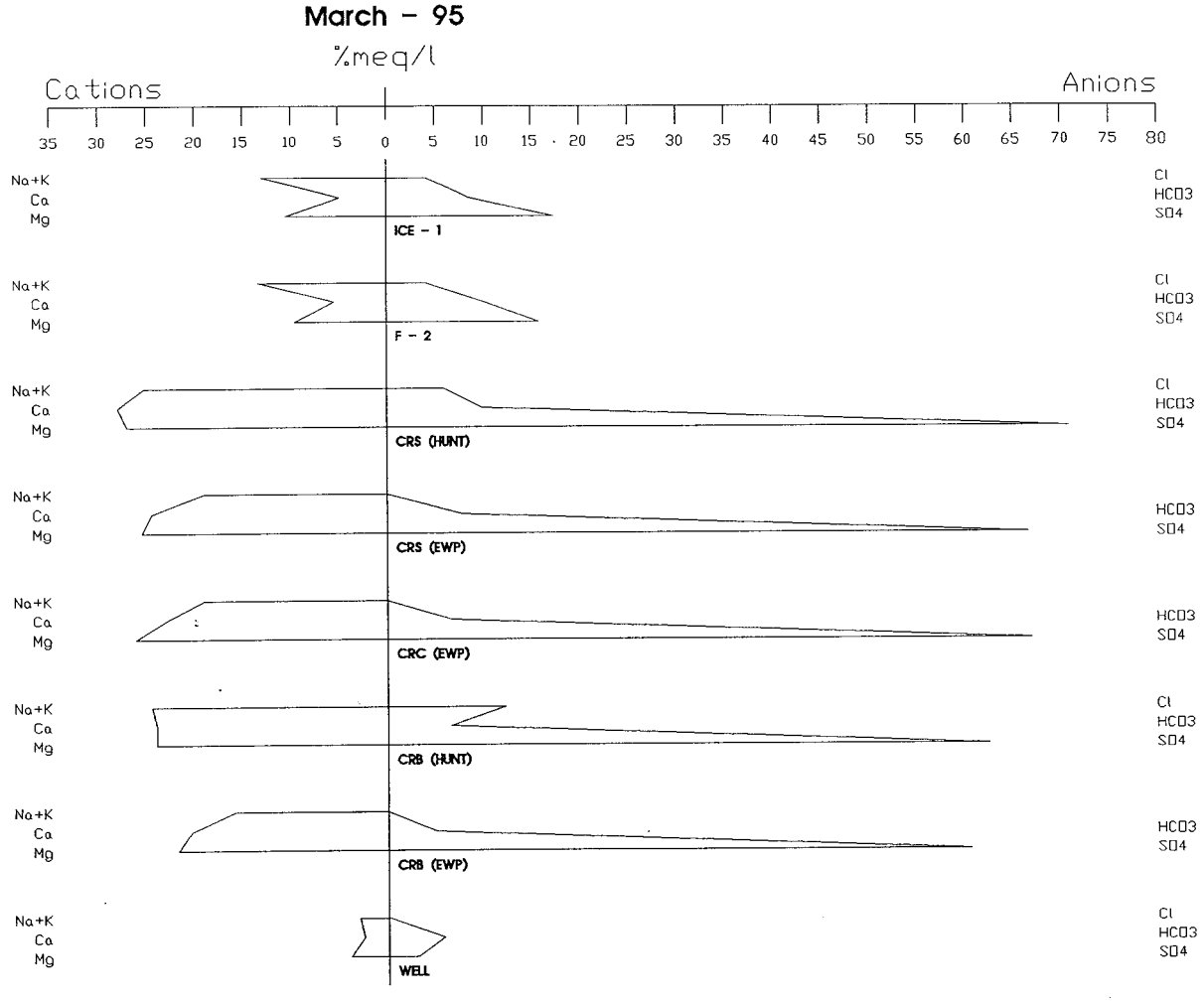
SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis, June 1993-1995



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 44

SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993–1995



ECKHOFF WATSON AND PREATOR ENGINEERING
ENGINEERS PLANNERS SURVEYORS

APPENDIX 7-4
FIGURE 45

SUNNYSIDE COGENERATION ASSOCIATES
Surface & Ground Water Monitoring Sites
Baseline Water Quality Analysis June 1993-1995

ATTACHMENT A

Huntingdon
Chen-Northern, Inc.
600 SOUTH 25TH STREET
P.O. BOX 30616
BILLINGS, MT 59107
(406) 248-9161
FAX (406) 248-9282

TECHNICAL REPORT

REPORT TO: ATTN: CHUCK WEMPLE
CHEN-NORTHERN, INC.
1127 WEST 2320 SOUTH, SUITE B
SALT LAKE CITY UT 84119

DATE: December 9, 1993
JOB NUMBER: 87-927
SHEET: 1 of 11
INVOICE NO.: 003917

REPORT OF: Water Analysis - SCA-DOGM 5-137.3-91

SAMPLE IDENTIFICATION:

On November 1, 1993, these water samples (our laboratory numbers 146281 through 146287) were received in our laboratory for analysis. Tests were conducted in accordance with the U.S. Environmental Protection Agency Manual EPA 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes."

The results of the analysis are shown on the following pages.

A < sign indicates the value reported was the practical quantitation limit for this sample using the method described. Concentrations of analyte, if present, below this were not quantifiable.

Post-it™ Fax Note 7671	Date 2/4/94	# of pages 4/4
To Scott Carlson	From Gil McDonald	
Co./Dept. EWP	Co. Chen-Northern	
Phone # 241-0990	Phone # 972-4787	
Fax # 266171	Fax #	

Reviewed by _____

rmr

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT Page 2
Project No.: 87-927
Laboratory No.: 146281
Sample Name: CRS-102693
Sample Date: 10/26/93
Collected by: G. HOWELL
Time Sampled: 1320
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
*ANIONS					
Alkalinity Bicarbonate as HCO3	548 mg/l	1.02	0900	11/09/93	BH
Alkalinity Carbonate as CO3	0 mg/l	-	0900	11/09/93	BH
Alkalinity Total as CaCO3	449 mg/l	0.84	0900	11/09/93	BH
Chloride as Cl	96 mg/l	0.24	1300	11/09/93	BH
Sulfate as SO4	2930 mg/l	2.29	1345	11/10/93	CC
*CATIONS					
Calcium as Ca	558 mg/l	0.39	1130	11/15/93	NH
Hardness as CaCO3	2800 mg/l	-	1130	11/15/93	NH
Magnesium as Mg	342 mg/l	0.31	1130	11/15/93	NH
Sodium as Na	543 mg/l	0.81	1130	11/15/93	NH
INORGANICS					
Electrical Conductivity	5310 umhos/cm	5.1	1500	11/12/93	BH
Oil & Grease	<1 mg/l	1	1130	11/05/93	CC
Settleable Solids	<0.2 ml/l	0.2	1510	11/01/93	CC
Sulfide as S	<1 mg/l	0.61	1500	11/02/93	DD
Total Dissolved Solids	5200 mg/l	11.7	1605	11/02/93	CC
Total Suspended Solids	41 mg/l	3.5	1525	11/02/93	CC
METALS					
Aluminum as Al (Dissolved	0.5 mg/l	0.023	1100	11/17/93	NH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/08/93	AH
Boron as B (Dissolved)	1.1 mg/l	0.045	1100	11/17/93	NH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1130	11/30/93	AH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1100	11/17/93	NH
Iron as Fe (Dissolved)	6.30 mg/l	0.008	1100	11/17/93	NH
Iron as Fe (Total)	47 mg/l	0.008	1330	12/01/93	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1400	11/22/93	NH
Manganese as Mn (Dissolved)	1.35 mg/l	0.003	1100	11/17/93	NH

* The cation-anion analysis does not meet our quality assurance requirements. However, the values reported herein were verified by duplicate analysis. This indicates there are other unmeasured cations or anions present in the sample.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT Page 3
Project No.: 87-927
Laboratory No.: 146281
Sample Name: CRS-102693
Sample Date: 10/26/93
Collected by: G. HOWELL
Time Sampled: 1320
Sample Type: WATER

PARAMETER	MEASURED VALUE		METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
METALS (cont)						
Manganese as Mn (Total)	2.2	mg/l	0.003	1330	12/01/93	BH
Molybdenum as Mn (Total)	<0.05	mg/l	0.023	1100	11/17/93	NH
Selenium as Se (Dissolved	<0.002	mg/l	0.0011	1400	11/10/93	AH
Zinc as Zn (Dissolved)	0.33	mg/l	0.008	1100	11/17/93	NH
NUTRIENTS						
Ammonia Nitrogen as N	1.73	mg/l	0.034	1130	11/12/30	DD
Nitrite as N	<0.05	mg/l	0.005	1130	11/02/93	DD
Phosphorous Total	0.68	mg/l	<0.002	1330	11/18/93	CC
Nitrate as N	0.33	mg/l	0.005	1130	11/03/93	DD

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Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT Page 4
Project No.: 87-927
Laboratory No.: 146282
Sample Name: CRB-102693
Sample Date: 10/26/93
Collected by: G. HOWELL
Time Sampled: 1400
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS**					
Alkalinity Bicarbonate as HCO3	384 mg/l	1.02	0900	11/09/93	BH
Alkalinity Carbonate as CO3	0 mg/l	-	0900	11/09/93	BH
Alkalinity Total as CaCO3	315 mg/l	0.84	0900	11/09/93	BH
Chloride as Cl	116 mg/l	0.24	1300	11/09/93	BH
Sulfate as SO4	2710 mg/l	2.29	1345	11/10/93	CC
CATIONS**					
Calcium as Ca	550 mg/l	0.39	1130	11/15/93	NH
Hardness as CaCO3	2810 mg/l	-	1130	11/15/93	NH
Magnesium as Mg	350 mg/l	0.31	1130	11/15/93	NH
Sodium as Na	555 mg/l	0.81	1130	11/15/93	NH
INORGANICS					
Electrical Conductivity	4860 umhos/cm	5.1	1500	11/12/93	BH
Oil & Grease	1 mg/l	1	1130	11/05/93	CC
Settleable Solids	<0.2 ml/l	0.2	1615	11/01/93	CC
Sulfide as S	1 mg/l	0.61	1500	11/02/93	DD
Total Dissolved Solids	4700 mg/l	11.7	1605	11/02/93	CC
Total Suspended Solids	<5 mg/l	3.5	1525	11/02/93	CC
METALS					
Aluminum as Al (Dissolved	0.5 mg/l	0.023	1100	11/17/93	NH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/08/93	AH
Boron as B (Dissolved)	1.0 mg/l	0.045	1100	11/17/93	NH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1130	11/30/93	AH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1100	11/17/93	NH

** The cation-anion analysis does not meet our quality assurance requirements. However, the values reported herein were verified by duplicate analysis. This indicates there are other unmeasured cations or anions present in the sample.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT Page 5
Project No.: 87-927
Laboratory No.: 146282
Sample Name: CRB-102693
Sample Date: 10/26/93
Collected by: G. HOWELL
Time Sampled: 1400
Sample Type: WATER

PARAMETER	MEASURED VALUE		METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
Iron as Fe (Dissolved)	*19.2	mg/l	0.008	1100	11/17/93	NH
Iron as Fe (Total)	*<0.05	mg/l	0.008	1330	12/01/93	BH
Lead as Pb (Dissolved)	<0.002	mg/l	0.0012	1400	11/22/93	NH
Manganese as Mn (Dissolved)	*1.35	mg/l	0.003	1100	11/17/93	NH
Manganese as Mn (Total)	*<0.02	mg/l	0.003	1330	12/01/93	BH
Molybdenum as Mn (Total)	<0.05	mg/l	0.023	1100	11/17/93	NH
Selenium as Se (Dissolved	<0.002	mg/l	0.0011	1400	11/10/93	AH
Zinc as Zn (Dissolved)	0.35	mg/l	0.008	1100	11/17/93	NH
NUTRIENTS						
Ammonia Nitrogen as N	<0.05	mg/l	0.034	1130	11/12/30	DD
Nitrite as N	<0.05	mg/l	0.005	1130	11/02/93	DD
Phosphorous Total	0.05	mg/l	<0.002	1330	11/18/93	CC
Nitrate as N	1.07	mg/l	0.005	1130	11/03/93	DD

* Samples were reanalyzed and results verified on December 8. These appear to be different samples.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT Page 6
Project No.: 87-927
Laboratory No.: 146283
Sample Name: F-Z/102793
Sample Date: 10/27/93
Collected by: G. HOWELL
Time Sampled: 0730
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as HCO3	622 mg/l	1.02	0900	11/09/93	BH
Alkalinity Carbonate as CO3	0 mg/l	-	0900	11/09/93	BH
Alkalinity Total as CaCO3	510 mg/l	0.84	0900	11/09/93	BH
Chloride as Cl	59 mg/l	0.24	1300	11/09/93	BH
Sulfate as SO4	700 mg/l	2.29	1145	11/09/93	CC
CATIONS					
Calcium as Ca	102 mg/l	0.39	1000	11/05/93	NH
Hardness as CaCO3	650 mg/l	-	1000	11/05/93	NH
Magnesium as Mg	96 mg/l	0.31	1000	11/05/93	NH
Sodium as Na	300 mg/l	0.81	1000	11/05/93	NH
INORGANICS					
Electrical Conductivity	2240 umhos/cm	5.1	1500	11/12/93	BH
Oil & Grease	3 mg/l	1	1130	11/05/93	CC
Settleable Solids	<0.2 ml/l	0.2	1615	11/01/93	CC
Sulfide as S	<1 mg/l	0.61	1500	11/02/93	DD
Total Dissolved Solids	1500 mg/l	11.7	1605	11/02/93	CC
Total Suspended Solids	9 mg/l	3.5	1525	11/02/93	CC
METALS					
Aluminum as Al (Dissolved	0.2 mg/l	0.023	1100	11/17/93	NH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/08/93	AH
Boron as B (Dissolved)	0.3 mg/l	0.045	1100	11/17/93	NH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1130	11/30/93	AH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1100	11/17/93	NH
Iron as Fe (Dissolved)	<0.05 mg/l	0.008	1100	11/17/93	NH
Iron as Fe (Total)	0.41 mg/l	0.008	1330	12/01/93	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1400	11/22/93	NH
Manganese as Mn (Dissolved)	0.04 mg/l	0.003	1100	11/17/93	NH
Manganese as Mn (Total)	0.06 mg/l	0.003	1330	12/01/93	BH
Molybdenum as Mn (Total)	<0.05 mg/l	0.023	1100	11/17/93	NH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	11/10/93	AH
Zinc as Zn (Dissolved)	1.02 mg/l	0.008	1100	11/17/93	NH
NUTRIENTS					
Ammonia Nitrogen as N	0.11 mg/l	0.034	1130	11/12/30	DD
Nitrite as N	<0.05 mg/l	0.005	1130	11/02/93	DD
Phosphorous Total	0.06 mg/l	<0.002	1330	11/18/93	CC
Nitrate as N	0.88 mg/l	0.005	1130	11/03/93	DD

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT Page 7
Project No.: 87-927
Laboratory No.: 146284
Sample Name: ICE-1/102693
Sample Date: 10/27/93
Collected by: G. HOWELL
Time Sampled: 0830
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as HCO3	593 mg/l	1.02	0900	11/09/93	BH
Alkalinity Carbonate as CO3	0 mg/l	-	0900	11/09/93	BH
Alkalinity Total as CaCO3	486 mg/l	0.84	0900	11/09/93	BH
Chloride as Cl	65 mg/l	0.24	1300	11/09/93	BH
Sulfate as SO4	777 mg/l	2.29	1145	11/09/93	CC
CATIONS					
Calcium as Ca	90 mg/l	0.39	1130	11/15/93	NH
Hardness as CaCO3	660 mg/l	-	1130	11/15/93	NH
Magnesium as Mg	105 mg/l	0.31	1000	11/05/93	NH
Sodium as Na	340 mg/l	0.81	1130	11/15/93	NH
INORGANICS					
Electrical Conductivity	2410 umhos/cm	5.1	1500	11/12/93	BH
Oil & Grease	<1 mg/l	1	1130	11/05/93	CC
Settleable Solids	<0.2 ml/l	0.2	0945	11/02/93	CC
Sulfide as S	<1 mg/l	0.61	1500	11/02/93	DD
Total Dissolved Solids	1600 mg/l	11.7	1605	11/02/93	CC
Total Suspended Solids	<2 mg/l	3.5	1525	11/02/93	CC
METALS					
Aluminum as Al (Dissolved	0.1 mg/l	0.023	1100	11/17/93	NH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/08/93	AH
Boron as B (Dissolved)	0.3 mg/l	0.045	1100	11/17/93	NH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1130	11/30/93	AH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1100	11/17/93	NH
Iron as Fe (Dissolved)	<0.05 mg/l	0.008	1100	11/17/93	NH
Iron as Fe (Total)	<0.05 mg/l	0.008	1330	12/01/93	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1400	11/22/93	NH
Manganese as Mn (Dissolved)	<0.02 mg/l	0.003	1100	11/17/93	NH
Manganese as Mn (Total)	<0.02 mg/l	0.003	1330	12/01/93	BH
Molybdenum as Mn (Total)	<0.05 mg/l	0.023	1100	11/17/93	NH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	11/10/93	AH
Zinc as Zn (Dissolved)	<0.02 mg/l	0.008	1100	11/17/93	NH
NUTRIENTS					
Ammonia Nitrogen as N	<0.05 mg/l	0.034	1130	11/12/30	DD
Nitrite as N	<0.05 mg/l	0.005	1130	11/02/93	DD
Phosphorous Total	0.05 mg/l	<0.002	1330	11/18/93	CC
Nitrate as N	0.77 mg/l	0.005	1130	11/03/93	DD

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT Page 8
Project No.: 87-927
Laboratory No.: 146285
Sample Name: WELL/102783
Sample Date: 10/27/93
Collected by: G. HOWELL
Time Sampled: 0915
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as HCO3	599 mg/l	1.02	0900	11/09/93	BH
Alkalinity Carbonate as CO3	0 mg/l	-	0900	11/09/93	BH
Alkalinity Total as CaCO3	491 mg/l	0.84	0900	11/09/93	BH
Chloride as Cl	47 mg/l	0.24	1300	11/09/93	BH
Sulfate as SO4	604 mg/l	2.29	1145	11/09/93	CC
CATIONS					
Calcium as Ca	99 mg/l	0.39	1130	11/15/93	NH
Hardness as CaCO3	590 mg/l	-	1130	11/15/93	NH
Magnesium as Mg	84 mg/l	0.31	1000	11/05/93	NH
Sodium as Na	276 mg/l	0.81	1000	11/05/93	NH
INORGANICS					
Electrical Conductivity	2100 umhos/cm	5.1	1500	11/12/93	BH
Oil & Grease	<1 mg/l	1	1130	11/05/93	CC
Settleable Solids	<0.2 ml/l	0.2	1130	11/02/93	CC
Sulfide as S	<1 mg/l	0.61	1500	11/02/93	DD
Total Dissolved Solids	1400 mg/l	11.7	1605	11/02/93	CC
Total Suspended Solids	<2 mg/l	3.5	1525	11/02/93	CC
METALS					
Aluminum as Al (Dissolved	<0.1 mg/l	0.023	1100	11/17/93	NH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/08/93	AH
Boron as B (Dissolved)	0.3 mg/l	0.045	1100	11/17/93	NH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1130	11/30/93	AH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1100	11/17/93	NH
Iron as Fe (Dissolved)	<0.05 mg/l	0.008	1100	11/17/93	NH
Iron as Fe (Total)	0.14 mg/l	0.008	1330	12/01/93	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1400	11/22/93	NH
Manganese as Mn (Dissolved)	<0.02 mg/l	0.003	1100	11/17/93	NH
Manganese as Mn (Total)	<0.02 mg/l	0.003	1330	12/01/93	BH
Molybdenum as Mn (Total)	<0.05 mg/l	0.023	1100	11/17/93	NH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	11/10/93	AH
Zinc as Zn (Dissolved)	<0.02 mg/l	0.008	1100	11/17/93	NH
NUTRIENTS					
Ammonia Nitrogen as N	<0.05 mg/l	0.034	1130	11/12/30	DD
Nitrite as N	<0.05 mg/l	0.005	1130	11/02/93	DD
Phosphorous Total	0.05 mg/l	<0.002	1330	11/18/93	CC
Nitrate as N	1.21 mg/l	0.005	1130	11/03/93	DD

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT Page 9
Project No.: 87-927
Laboratory No.: 146286
Sample Name: DUPLICATE 146281 CRS/102693
Sample Date: 10/26/93
Collected by: G. HOWELL
Time Sampled: 1320
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS*					
Alkalinity Bicarbonate as HCO3	542 mg/l	1.02	0900	11/09/93	BH
Alkalinity Carbonate as CO3	0 mg/l	-	0900	11/09/93	BH
Alkalinity Total as CaCO3	444 mg/l	0.84	0900	11/09/93	BH
Chloride as Cl	97 mg/l	0.24	1300	11/09/93	BH
Sulfate as SO4	2860 mg/l	2.29	1345	11/10/93	CC
CATIONS*					
Calcium as Ca	549 mg/l	0.39	1130	11/15/93	NH
Hardness as CaCO3	2780 mg/l	-	1130	11/15/93	NH
Magnesium as Mg	342 mg/l	0.31	1130	11/15/93	NH
Sodium as Na	552 mg/l	0.81	1130	11/15/93	NH
INORGANICS					
Electrical Conductivity	5370 umhos/cm	5.1	1500	11/12/93	BH
Settleable Solids	<0.2 ml/l	0.2	1510	11/01/93	CC
Sulfide as S	<1 mg/l	0.61	1500	11/02/93	DD
Total Dissolved Solids	5100 mg/l	11.7	1605	11/02/93	CC
Total Suspended Solids	42 mg/l	3.5	1525	11/02/93	CC
METALS					
Aluminum as Al (Dissolved	0.4 mg/l	0.023	1100	11/17/93	NH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/08/93	AH
Boron as B (Dissolved)	1.0 mg/l	0.045	1100	11/17/93	NH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1130	11/30/93	AH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1100	11/17/93	NH
Iron as Fe (Dissolved)	6.35 mg/l	0.008	1100	11/17/93	NH
Iron as Fe (Total)	50 mg/l	0.008	1330	12/01/93	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1400	11/22/93	NH
Manganese as Mn (Dissolved)	1.30 mg/l	0.003	1100	11/17/93	NH
Manganese as Mn (Total)	2.3 mg/l	0.003	1330	12/01/93	BH

* The cation-anion analysis does not meet our quality assurance requirements. However, the values reported herein were verified by duplicate analysis. This indicates there are other unmeasured cations or anions present in the sample.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT Page 10
Project No.: 87-927
Laboratory No.: 146286
Sample Name: DUPLICATE 146281 CRS/102693
Sample Date: 10/26/93
Collected by: G. HOWELL
Time Sampled: 1320
Sample Type: WATER

PARAMETER	MEASURED VALUE		METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
Molybdenum as Mn (Total)	<0.05	mg/l	0.023	1100	11/17/93	NH
Selenium as Se (Dissolved	<0.002	mg/l	0.0011	1400	11/10/93	AH
Zinc as Zn (Dissolved)	0.34	mg/l	0.008	1100	11/17/93	NH
NUTRIENTS						
Ammonia Nitrogen as N	1.73	mg/l	0.034	1130	11/12/30	DD
Nitrite as N	<0.05	mg/l	0.005	1130	11/02/93	DD
Phosphorous Total	0.85	mg/l	<0.002	1330	11/18/93	CC
Nitrate as N	0.34	mg/l	0.005	1130	11/03/93	DD

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT Page 11
Project No.: 87-927
Laboratory No.: 146287
Sample Name: SPIKE 146284 ICE-1/102793
Sample Date: 10/26/93
Collected by: G. HOWELL
Time Sampled: 1320
Sample Type: WATER

PARAMETER	MEASURED VALUE		TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Total as CaCO3	98	%	0900	11/09/93	BH
Chloride as Cl	95	%	1300	11/09/93	BH
Sulfate as SO4	97	%	1145	11/09/93	CC
CATIONS					
Calcium as Ca	100	%	1130	11/15/93	NH
Magnesium as Mg	102	%	1130	11/15/93	NH
Sodium as Na	100	%	1130	11/15/93	NH
INORGANICS					
Sulfide as S	110	%	1500	11/02/93	DD
METALS					
Aluminum as Al (Dissolved	94	%	1100	11/17/93	NH
Arsenic as As (Dissolved)	93	%	1300	11/08/93	AH
Boron as B (Dissolved)	104	%	1100	11/17/93	NH
Cadmium as Cd (Dissolved)	105	%	1130	11/30/93	AH
Copper as Cu (Dissolved)	100	%	1100	11/17/93	NH
Iron as Fe (Dissolved)	104	%	1100	11/17/93	NH
Iron as Fe (Total)	100	%	1330	12/01/93	BH
Lead as Pb (Dissolved)	90	%	1400	11/22/93	NH
Manganese as Mn (Dissolved)	100	%	1100	11/17/93	NH
Manganese as Mn (Total)	90	%	1330	12/01/93	BH
Molybdenum as Mn (Total)	100	%	1100	11/17/93	NH
Selenium as Se (Dissolved	100	%	1400	11/10/93	AH
Zinc as Zn (Dissolved)	100	%	1100	11/17/93	NH
NUTRIENTS					
Ammonia Nitrogen as N	106	%	1130	11/12/30	DD
Nitrite as N	103	%	1130	11/02/93	DD
Phosphorous Total	96	%	1330	11/18/93	CC
Nitrate as N	102	%	1130	11/03/93	DD

SCA - DOGM
Project or Site Name

5-137.3-91 DOGM
Project Number

G Howell
Sampler Name (Printed)

Huntingdon

Consulting Engineers · Environmental Scientists

- ☑ Chen-Northern, Inc., Division
- ☐ Thomas-Hartig & Associates, Inc., Division
- ☐ Schaefer Dixon Associates, Inc., Division
- ☐ Herzog Associates, Inc., Division

Chuck Wempe
Contact or Report to

1177 W. 2320 S. & B. SLC, Ut. 84119
Contact Address or Location

[signature]
Sampler Signature

FEB- 9-94 WED 13:38 CHEN NORTHERN FAX NO. 8014870963 P.12

DATE COLLECTED	TIME COLLECTED	SAMPLE LOCATION OR DESCRIPTION	COMP OR GRAB	SAMPLE MATRIX	NO. OF CONTAINERS	ANALYSIS REQUIRED: 431	Sulfide	Total metals	Dissolved metals	TSS	Settleable Solids	Cyanide	NOTES	LAB NUMBER
10-26-93	1320	CRS/102693	grab	H_2O	7 Rec'd 6 cont	x	x	x	x	x	x	x	413.1, Nut, TSS/DS, Metals Sulfide	146281
10-26-93	1400	CRB/102693	grab	H_2O	7 Rec'd 6 cont	x	x	x	x	x	x	x		82
10-27-93	0730	F-2/102793	grab	H_2O	7	x	x	x	x	x	x	x		83
10-27-93	0830	ICE-1/102793	grab	H_2O	7	x	x	x	x	x	x	x		84
10-27-93	0915	WELL/102793	grab	H_2O	7	x	x	x	x	x	x	x		85
													Dup 146281 CRS/102693 10/26 1320	86
													Sp 146284 ICE-1/102793 10/27 0830	87
													Sulfide	
													+ Nitrogen preserved in lab - (was past holding time) ... on 11/1/93 3:15pm	

Relinquished by:	Date	Time	Received by:
Carrier Bill	11/1/93	1100	CNI Lab Bigs / H Cleveland
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:

Remarks: Attn: David Council
See attached list for complete parameter listing

Cooler temp 15.7°C [initials]

Huntingdon
Chen-Northern, Inc.
600 SOUTH 25TH STREET
P.O. BOX 30615
BILLINGS, MT 59107
(406) 248-9161
FAX (406) 248-9282

TECHNICAL REPORT

REPORT TO: ATTN: CHUCK WEMPLE
CHEN-NORTHERN, INC.
1127 WEST 2320 SOUTH, SUITE B
SALT LAKE CITY UT 84119

DATE: November 30, 1993
JOB NUMBER: 87-927
SHEET: 1 of 9
INVOICE NO.: 003888

REPORT OF: Water Analysis - SCA-SWD - 5-137.2-91

SAMPLE IDENTIFICATION:

On November 1, 1993, these water samples (our laboratory numbers 146273 through 146280) were received in our laboratory for analysis. Tests were conducted in accordance with the U.S. Environmental Protection Agency Manual EPA 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes."

The results of the analysis are shown on the following pages.

A < sign indicates the value reported was the practical quantitation limit for this sample using the method described. Concentrations of analyte, if present, below this were not quantifiable.

Reviewed by David Cornish

mc

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 146273
Sample Name: CRB 004/102693
Sample Date: 10/26/93
Collected by: M. HOWELL
Time Sampled: 1140
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as HCO3	580 mg/l		1600	11/08/93	BH
Alkalinity Carbonate as CO3	10 mg/l		1600	11/08/93	BH
Alkalinity Total as CaCO3	493 mg/l	0.84	1600	11/08/93	BH
Chloride as Cl	86 mg/l	0.24	1300	11/08/93	BH
Sulfate as SO4	436 mg/l	2.29	1145	11/09/93	CC
CATIONS					
Calcium as Ca	24 mg/l	0.39	0930	11/04/93	NH
Hardness as CaCO3	134 mg/l		0930	11/04/93	NH
Magnesium as Mg	18 mg/l	0.31	0930	11/04/93	NH
Potassium as K	14 mg/l	0.18	1400	11/01/93	AH
Sodium as Na	432 mg/l	0.81	0930	11/04/93	NH
INORGANICS					
pH	8.5 S.U.		1600	11/01/93	BH
Total Dissolved Solids	1300 mg/l	11.7	1605	11/02/93	CC
METALS					
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/05/93	AH
Barium as Ba (Dissolved)	<0.1 mg/l	0.031	1500	11/04/93	NH
Cadmium as Cd (Dissolved)	<0.003 mg/l	0.002	1500	11/04/93	NH
Chromium as Cr (Dissolved	<0.02 mg/l	0.009	1500	11/04/93	NH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1500	11/04/93	NH
Lead as Pb (Dissolved)	<0.01 mg/l	0.0012	1530	11/22/93	NH
Mercury as Hg (Dissolved)	<0.0005mg/l	0.00025	1000	11/09/93	AH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	11/11/93	AH
Silver as Ag (Dissolved)	<0.01 mg/l	0.011	1345	11/24/93	BH
Zinc as Zn (Dissolved)	0.08 mg/l	0.008	1500	11/04/93	NH

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 146274
Sample Name: WHITMORE SPRINGS/102793
Sample Date: 10/27/93
Collected by: M. HOWELL
Time Sampled: 0730
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as HCO3	636 mg/l		1600	11/08/93	BH
Alkalinity Carbonate as CO3	0 mg/l		1600	11/08/93	BH
Alkalinity Total as CaCO3	521 mg/l	0.84	1600	11/08/93	BH
Chloride as Cl	70 mg/l	0.24	1300	11/08/93	BH
Sulfate as SO4	660 mg/l	1.83	1145	11/09/93	CC
CATIONS					
Calcium as Ca	96 mg/l	0.39	1130	11/15/93	NH
Hardness as CaCO3	660 mg/l		1130	11/15/93	NH
Magnesium as Mg	102 mg/l	0.31	1130	11/15/93	NH
Potassium as K	8 mg/l	0.18	1400	11/01/93	AH
Sodium as Na	309 mg/l	0.81	1130	11/15/93	NH
INORGANICS					
pH	8.3 S.U.		1600	11/01/93	BH
Total Dissolved Solids	1500 mg/l	11.7	1605	11/02/93	CC
METALS					
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/05/93	AH
Barium as Ba (Dissolved)	<0.1 mg/l	0.031	1500	11/04/93	NH
Cadmium as Cd (Dissolved)	<0.003 mg/l	0.002	1500	11/04/93	NH
Chromium as Cr (Dissolved	<0.02 mg/l	0.009	1500	11/04/93	NH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1500	11/04/93	NH
Lead as Pb (Dissolved)	<0.01 mg/l	0.0012	1530	11/22/93	NH
Mercury as Hg (Dissolved)	<0.0005mg/l	.00025	1000	11/09/93	AH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	11/11/93	AH
Silver as Ag (Dissolved)	0.02 mg/l	0.011	1345	11/24/93	BH
Zinc as Zn (Dissolved)	<0.02 mg/l	0.008	1500	11/04/93	NH

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 146275
Sample Name: FRESH WATER RES./102793
Sample Date: 10/27/93
Collected by: M. HOWELL
Time Sampled: 1000
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as HCO3	494 mg/l		1600	11/08/93	BH
Alkalinity Carbonate as CO3	21 mg/l		1600	11/08/93	BH
Alkalinity Total as CaCO3	440 mg/l	0.84	1600	11/08/93	BH
Chloride as Cl	39 mg/l	0.24	1300	11/08/93	BH
Sulfate as SO4	358 mg/l	1.83	1600	11/22/93	CC
CATIONS					
Calcium as Ca	39 mg/l	0.39	1130	11/15/93	NH
Hardness as CaCO3	270 mg/l		1130	11/15/93	NH
Magnesium as Mg	42 mg/l	0.31	1130	11/15/93	NH
Potassium as K	8 mg/l	0.18	1400	11/01/93	AH
Sodium as Na	278 mg/l	0.81	1130	11/15/93	NH
INORGANICS					
pH	8.8 S.U.		1600	11/01/93	BH
Total Dissolved Solids	960 mg/l	11.7	1605	11/02/93	CC
METALS					
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/05/93	AH
Barium as Ba (Dissolved)	<0.1 mg/l	0.031	1500	11/04/93	NH
Cadmium as Cd (Dissolved)	<0.003 mg/l	0.002	1500	11/04/93	NH
Chromium as Cr (Dissolved	<0.02 mg/l	0.009	1500	11/04/93	NH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1500	11/04/93	NH
Lead as Pb (Dissolved)	<0.01 mg/l	0.0012	1530	11/22/93	NH
Mercury as Hg (Dissolved)	<0.0005mg/l	0.00025	1000	11/09/93	AH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	11/11/93	AH
Silver as Ag (Dissolved)	<0.01 mg/l	0.011	1345	11/24/93	BH
Zinc as Zn (Dissolved)	1.70 mg/l	0.008	1500	11/04/93	NH

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 146276
Sample Name: MW-1/102793
Sample Date: 10/27/93
Collected by: M. HOWELL
Time Sampled: 1140
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as HCO3	615 mg/l		1600	11/08/93	BH
Alkalinity Carbonate as CO3	0 mg/l		1600	11/08/93	BH
Alkalinity Total as CaCO3	504 mg/l	0.84	1600	11/08/93	BH
Chloride as Cl	85 mg/l	0.24	1300	11/08/93	BH
Sulfate as SO4	1050 mg/l	1.83	1145	11/09/93	CC
CATIONS					
Calcium as Ca	153 mg/l	0.39	0930	11/04/93	NH
Hardness as CaCO3	1099 mg/l		0930	11/04/93	NH
Magnesium as Mg	174 mg/l	0.31	0930	11/04/93	NH
Potassium as K	9 mg/l	0.18	1400	11/01/93	AH
Sodium as Na	294 mg/l	0.81	0930	11/04/93	NH
INORGANICS					
pH	7.7 S.U.		1600	11/01/93	BH
Total Dissolved Solids	2100 mg/l	11.7	1605	11/02/93	CC
METALS					
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/05/93	AH
Barium as Ba (Dissolved)	<0.1 mg/l	0.031	1500	11/04/93	NH
Cadmium as Cd (Dissolved)	<0.003 mg/l	0.002	1500	11/04/93	NH
Chromium as Cr (Dissolved	*<0.03 mg/l	0.009	1500	11/04/93	NH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1500	11/04/93	NH
Lead as Pb (Dissolved)	<0.01 mg/l	0.0012	1530	11/22/93	NH
Mercury as Hg (Dissolved)	<0.0005mg/l	0.00025	1000	11/09/93	AH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	11/11/93	AH
Silver as Ag (Dissolved)	0.02 mg/l	0.011	1345	11/24/93	BH
Zinc as Zn (Dissolved)	0.34 mg/l	0.008	1500	11/04/93	NH

* Higher detection limit due to the presence of interfering elements.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 146277
Sample Name: MW-2/102793
Sample Date: 10/27/93
Collected by: M. HOWELL
Time Sampled: 1240
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as HCO3	602 mg/l		1600	11/08/93	BH
Alkalinity Carbonate as CO3	0 mg/l		1600	11/08/93	BH
Alkalinity Total as CaCO3	493 mg/l	0.84	1600	11/08/93	BH
Chloride as Cl	74 mg/l	0.24	1300	11/08/93	BH
Sulfate as SO4	736 mg/l	1.83	1145	11/09/93	CC
CATIONS					
Calcium as Ca	102 mg/l	0.39	1130	11/15/93	NH
Hardness as CaCO3	712 mg/l		1130	11/15/93	NH
Magnesium as Mg	111 mg/l	0.31	0930	11/04/93	NH
Potassium as K	12 mg/l	0.18	1400	11/01/93	AH
Sodium as Na	309 mg/l	0.81	0930	11/04/93	NH
INORGANICS					
pH	7.8 S.U.		1600	11/01/93	BH
Total Dissolved Solids	1600 mg/l	11.7	1605	11/02/93	CC
METALS					
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/05/93	AH
Barium as Ba (Dissolved)	<0.1 mg/l	0.031	1500	11/04/93	NH
Cadmium as Cd (Dissolved)	<0.003 mg/l	0.002	1500	11/04/93	NH
Chromium as Cr (Dissolved	<0.02 mg/l	0.009	1500	11/04/93	NH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1500	11/04/93	NH
Lead as Pb (Dissolved)	<0.01 mg/l	0.0012	1530	11/22/93	NH
Mercury as Hg (Dissolved)	<0.0005mg/l	0.00025	1000	11/09/93	AH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	11/11/93	AH
Silver as Ag (Dissolved)	0.02 mg/l	0.011	1345	11/24/93	BH
Zinc as Zn (Dissolved)	0.07 mg/l	0.008	1500	11/04/93	NH

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 146278
Sample Name: MW-3/102793
Sample Date: 10/27/93
Collected by: M. HOWELL
Time Sampled: 1330
Sample Type: WATER

PARAMETER		MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3		649 mg/l		1600	11/08/93	BH
Alkalinity Carbonate as CO3		0 mg/l		1600	11/08/93	BH
Alkalinity Total as CaCO3		532 mg/l	0.84	1600	11/08/93	BH
Chloride as Cl		79 mg/l	0.24	1300	11/08/93	BH
Sulfate as SO4		928 mg/l	1.83	1145	11/09/93	CC
CATIONS						
Calcium as Ca		132 mg/l	0.39	0930	11/04/93	NH
Hardness as CaCO3		923 mg/l		0930	11/04/93	NH
Magnesium as Mg		144 mg/l	0.31	0930	11/04/93	NH
Potassium as K		10 mg/l	0.18	1400	11/01/93	AH
Sodium as Na		321 mg/l	0.81	0930	11/04/93	NH
INORGANICS						
pH		7.9 S.U.		1600	11/01/93	BH
Total Dissolved Solids		1900 mg/l	11.7	1605	11/02/93	CC
METALS						
Arsenic as As (Dissolved)		<0.002 mg/l	0.0014	1300	11/05/93	AH
Barium as Ba (Dissolved)		<0.1 mg/l	0.031	1500	11/04/93	NH
Cadmium as Cd (Dissolved)		<0.003 mg/l	0.002	1500	11/04/93	NH
Chromium as Cr (Dissolved	*	<0.03 mg/l	0.009	1500	11/04/93	NH
Copper as Cu (Dissolved)		<0.02 mg/l	0.0095	1500	11/04/93	NH
Lead as Pb (Dissolved)		<0.01 mg/l	0.012	1530	11/22/93	NH
Mercury as Hg (Dissolved)		<0.0005mg/l	0.00025	1000	11/09/93	AH
Selenium as Se (Dissolved		<0.002 mg/l	0.0011	1400	11/10/93	AH
Silver as Ag (Dissolved)		0.02 mg/l	0.011	1345	11/24/93	BH
Zinc as Zn (Dissolved)		0.02 mg/l	0.008	1500	11/04/93	NH

* Higher detection limit due to the presence of interfering elements.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 146279
Sample Name: DUPLICATE 146274 WHITMORE SPRINGS/102793
Sample Date: 10/27/93
Collected by: M. HOWELL
Time Sampled: 0730
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as HCO3	626 mg/l		1600	11/08/93	BH
Alkalinity Carbonate as CO3	0 mg/l		1600	11/08/93	BH
Alkalinity Total as CaCO3	513 mg/l	0.84	1600	11/08/93	BH
Chloride as Cl	67 mg/l	0.24	1300	11/08/93	BH
Sulfate as SO4	667 mg/l	1.83	1145	11/09/93	CC
CATIONS					
Calcium as Ca	99 mg/l	0.39	1130	11/15/93	NH
Hardness as CaCO3	667 mg/l		1130	11/15/93	NH
Magnesium as Mg	102 mg/l	0.31	0930	11/04/93	NH
Potassium as K	8 mg/l	0.18	1400	11/01/93	AH
Sodium as Na	309 mg/l	0.81	1130	11/15/93	NH
INORGANICS					
pH	8.5 S.U.		1600	11/01/93	BH
Total Dissolved Solids	1500 mg/l	11.7	1605	11/02/93	CC
METALS					
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1300	11/05/93	AH
Barium as Ba (Dissolved)	<0.01 mg/l	0.031	1500	11/04/93	NH
Cadmium as Cd (Dissolved)	<0.003 mg/l	0.002	1500	11/04/93	NH
Chromium as Cr (Dissolved	<0.02 mg/l	0.009	1500	11/04/93	NH
Copper as Cu (Dissolved)	<0.02 mg/l	0.005	1500	11/04/93	NH
Lead as Pb (Dissolved)	<0.01 mg/l	0.012	1530	11/22/93	NH
Mercury as Hg (Dissolved)	<0.0005mg/l	0.00025	1000	11/09/93	AH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	11/11/93	AH
Silver as Ag (Dissolved)	0.02 mg/l	0.011	1345	11/24/93	BH
Zinc as Zn (Dissolved)	<0.02 mg/l	0.008	1500	11/04/93	NH

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 146280
Sample Name: SPIKE 146277 MW-2/102793
Sample Date: 10/27/93
Collected by: M. HOWELL
Time Sampled: 1240
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Total as CaCO3	100 %	0.84	1600	11/08/93	BH
Chloride as Cl	98 %	0.24	1300	11/08/93	BH
Sulfate as SO4	102 %	1.83	1145	11/09/93	CC
CATIONS					
Calcium as Ca	101 %	0.39	0930	11/04/93	NH
Magnesium as Mg	100 %	0.31	0930	11/04/93	NH
Potassium as K	100 %	0.18	1400	11/01/93	AH
Sodium as Na	101 %	0.81	0930	11/04/93	NH
METALS					
Arsenic as As (Dissolved)	93 %	0.0014	1300	11/05/93	AH
Barium as Ba (Dissolved)	96 %	0.031	1500	11/04/93	NH
Cadmium as Cd (Dissolved)	94 %	0.002	1500	11/04/93	NH
Chromium as Cr (Dissolved	88 %	0.009	1500	11/04/93	NH
Copper as Cu (Dissolved)	84 %	0.005	1500	11/04/93	NH
Lead as Pb (Dissolved)	104 %	0.012	1530	11/22/93	NH
Mercury as Hg (Dissolved)	100 %	0.00025	1000	11/09/93	AH
Selenium as Se (Dissolved	100 %	0.0011	1400	11/11/93	AH
Silver as Ag (Dissolved)	97 %	0.011	1345	11/24/93	BH
Zinc as Zn (Dissolved)	100 %	0.008	1500	11/04/93	NH

Huntingdon
Chen-Northern, Inc.
600 SOUTH 25TH STREET
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BILLINGS, MT 59107
(406) 248-9161
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TECHNICAL REPORT

REPORT TO: ATTN: CHUCK WEMPLE
CHEN-NORTHERN, INC.
1127 WEST 2320 SOUTH, SUITE B
SALT LAKE CITY UT 84119

DATE: February 28, 1994
JOB NUMBER: 87-927
SHEET: 1 of 14
INVOICE NO.: 026905

REPORT OF: Surface Water Analysis - SCA DOGM 5-137.3-91

SAMPLE IDENTIFICATION:

On January 18, 1994, these surface water samples (our laboratory numbers 148524 through 148530) were received in our laboratory for analysis. Tests were conducted in accordance with the U.S. Environmental Protection Agency Manual EPA 600/4-79-020 *"Methods for Chemical Analysis of Water and Wastes."*

The test results are shown on the following pages.

A < sign indicates the value reported was the practical quantitation limit for this sample using the method described. Concentrations of analyte, if present, below this were not quantifiable.

The samples were received cool and were properly preserved in accordance with EPA guidelines.

Reviewed by David Cowan

MC

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148524
Sample Name: CRS/011494
Sample Date: 01/14/94
Collected by: GREG McDONALD
Time Sampled: 1035
Sample Type: SURFAACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as	570 mg/l		1100	02/10/94	HB
Alkalinity Carbonate as C	0 mg/l		1100	02/10/94	HB
Alkalinity Total as CaCO3	467 mg/l	0.84	1100	02/10/94	HB
Chloride as Cl	97 mg/l	1.41	1400	01/26/94	HB
Sulfate as SO4	3180 mg/l	2.29	1115	02/02/94	CC
CATIONS					
Calcium as Ca	560 mg/l	0.39	1600	02/04/94	BH
Hardness as CaCO3	2800 mg/l		1600	02/04/94	BH
Magnesium as Mg	340 mg/l	0.31	1600	02/04/94	BH
Potassium as K	56 mg/l	0.18	1400	01/28/94	AH
Sodium as Na	530 mg/l	0.81	1600	02/04/94	BH
INORGANICS					
Oil & Grease	<1 mg/l	0.9	1030	01/27/94	TK
Settleable Solids	0.4 ml/l	0.1	1150	01/19/94	CC
Total Dissolved Solids	4930 mg/l	11.7	1720	01/20/94	HB
Total Suspended Solids	16 mg/l	3.5	1300	01/21/94	HB
METALS					
Aluminum as Al (Dissolved	* <0.5 mg/l	0.023	1400	02/03/94	BH
Arsenic as As (Dissolved)	0.005 mg/l	0.0014	0930	01/20/94	AH
Boron as B (Dissolved)	1.0 mg/l	0.045	1100	02/03/94	BH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1100	01/27/94	BH
Copper as Cu (Dissolved)	* <0.10 mg/l	0.005	1100	02/03/94	BH
Iron as Fe (Dissolved)	12 mg/l	0.008	1100	02/03/94	BH
Iron as Fe (Total)	21 mg/l	0.008	1630	02/03/94	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1300	01/20/94	AH
Manganese as Mn (Dissolve	0.33 mg/l	0.003	1500	02/25/94	BH
Manganese as Mn (Total)	0.60 mg/l	0.003	1500	02/25/94	BH
Molybdenum as Mo (Dissolv	* <0.25 mg/l	0.023	1100	02/03/94	BH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1130	01/21/94	AH
Zinc as Zn (Dissolved)	* <0.10 mg/l	0.008	1100	02/03/94	BH

* Higher detection limit is due to interference present in the sample.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148524
Sample Name: CRS/011494
Sample Date: 01/14/94
Collected by: GREG McDONALD
Time Sampled: 1035
Sample Type: SURFAACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
NUTRIENTS					
Ammonia Nitrogen as N	2.11 mg/l	0.034	1515	01/24/94	CC
Nitrite as N	<0.05 mg/l	0.005	1200	01/20/94	DD
Phosphorous Total	0.76 mg/l	0.002	1600	02/09/94	CC
Nitrate as N	0.22 mg/l	0.005	1015	01/28/94	CC

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148525
Sample Name: CRB-011494
Sample Date: 01/14/94
Collected by: GREG McDONALD
Time Sampled: 1130
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as	369 mg/l		1100	01/22/94	HB
Alkalinity Carbonate as C	0 mg/l		1100	01/22/94	HB
Alkalinity Total as CaCO3	302 mg/l	0.84	1100	01/22/94	HB
Chloride as Cl	121 mg/l	1.41	1400	01/26/94	HB
Sulfate as SO4	2780 mg/l	2.29	1115	02/02/94	CC
CATIONS					
Calcium as Ca	490 mg/l	0.39	0930	01/21/94	BH
Hardness as CaCO3	2400 mg/l		0930	01/21/94	BH
Magnesium as Mg	290 mg/l	0.31	0930	01/21/94	BH
Potassium as K	39 mg/l	0.18	1400	01/28/94	AH
Sodium as Na	450 mg/l	0.81	0930	01/21/94	BH
INORGANICS					
Oil & Grease	<1 mg/l	0.9	1030	01/27/94	TK
Settleable Solids	<0.1 ml/l	0.1	0940	01/19/94	CC
Total Dissolved Solids	4320 mg/l	11.7	1720	01/20/94	HB
Total Suspended Solids	<5 mg/l	3.5	1300	01/21/94	HB
METALS					
Aluminum as Al (Dissolved	* <0.5 mg/l	0.023	1400	02/03/94	BH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	0930	01/20/94	AH
Boron as B (Dissolved)	0.7 mg/l	0.045	1100	02/03/94	BH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1100	01/27/94	BH
Copper as Cu (Dissolved)	* <0.10 mg/l	0.005	1100	02/03/94	BH
Iron as Fe (Dissolved)	* <0.25 mg/l	0.008	1330	02/08/94	BH
Iron as Fe (Total)	* <0.25 mg/l	0.008	1630	02/03/94	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1300	01/20/94	AH
Manganese as Mn (Dissolve	* <0.20 mg/l	0.003	1100	02/03/94	BH
Manganese as Mn (Total)	* <0.10 mg/l	0.003	1630	02/03/94	BH
Molybdenum as Mo (Dissolv	* <0.25 mg/l	0.023	1100	02/03/94	BH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1130	01/21/94	AH
Zinc as Zn (Dissolved)	* <0.10 mg/l	0.008	1100	02/03/94	BH

* Higher detection limit is due to interference present in the sample.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148525
Sample Name: CRB-011494
Sample Date: 01/14/94
Collected by: GREG McDONALD
Time Sampled: 1130
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
NUTRIENTS					
Ammonia Nitrogen as N	<0.05 mg/l	0.034	1515	01/24/94	CC
Nitrite as N	<0.05 mg/l	0.005	1200	01/20/94	DD
Phosphorous Total	<0.02 mg/l	0.002	1600	02/09/94	CC
Nitrate as N	1.33 mg/l	0.005	1015	01/28/94	CC

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148526
Sample Name: F-2/011394
Sample Date: 01/13/94
Collected by: GREG McDONALD
Time Sampled: 1600
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as	605 mg/l		1100	02/10/94	HB
Alkalinity Carbonate as C	0 mg/l		1100	02/10/94	HB
Alkalinity Total as CaCO3	496 mg/l	0.84	1100	02/10/94	HB
Chloride as Cl	44 mg/l	1.41	1400	01/26/94	HB
Sulfate as SO4	632 mg/l	2.29	1115	02/02/94	CC
CATIONS					
Calcium as Ca	94 mg/l	0.39	1600	02/04/94	BH
Hardness as CaCO3	690 mg/l		1600	02/04/94	BH
Magnesium as Mg	110 mg/l	0.31	1600	02/04/94	BH
Potassium as K	7 mg/l	0.18	1400	01/28/94	AH
Sodium as Na	260 mg/l	0.81	1600	02/04/94	BH
INORGANICS					
Oil & Grease	<1 mg/l	0.9	1030	01/27/94	TK
Settleable Solids	<0.1 ml/l	0.1	0940	01/19/94	CC
Total Dissolved Solids	1390 mg/l	11.7	1720	01/20/94	HB
Total Suspended Solids	<5 mg/l	3.5	1300	01/21/94	HB
METALS					
Aluminum as Al (Dissolved	* <0.5 mg/l	0.023	1400	02/03/94	BH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	0930	01/20/94	AH
Boron as B (Dissolved)	* <0.5 mg/l	0.045	1100	02/03/94	BH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1100	01/27/94	BH
Copper as Cu (Dissolved)	* <0.10 mg/l	0.005	1100	02/03/94	BH
Iron as Fe (Dissolved)	* <0.25 mg/l	0.008	1100	02/03/94	BH
Iron as Fe (Total)	0.30 mg/l	0.008	1630	02/03/94	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1300	01/20/94	AH
Manganese as Mn (Dissolve	* <0.10 mg/l	0.003	1100	02/03/94	BH
Manganese as Mn (Total)	0.10 mg/l	0.003	1630	02/03/94	BH
Molybdenum as Mo (Dissolv	* <0.25 mg/l	0.023	1100	02/03/94	BH
Selenium as Se (Dissolved	<0.002 mg/l	0.0019	1130	01/21/94	AH
Zinc as Zn (Dissolved)	* <0.10 mg/l	0.008	1100	02/03/94	BH

* Higher detection limit is due to interference present in the sample.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148526
Sample Name: F-2/011394
Sample Date: 01/13/94
Collected by: GREG McDONALD
Time Sampled: 1600
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
NUTRIENTS					
Ammonia Nitrogen as N	<0.05 mg/l	0.034	1515	01/24/94	CC
Nitrite as N	<0.05 mg/l	0.005	1200	01/20/94	DD
Phosphorous Total	<0.02 mg/l	0.002	1600	02/09/94	CC
Nitrate as N	0.97 mg/l	0.005	1015	01/28/94	CC

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148527
Sample Name: ICE-1/0113394
Sample Date: 01/13/94
Collected by: GREG McDONALD
Time Sampled: 1454
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as	519 mg/l		1100	01/22/94	HB
Alkalinity Carbonate as C	0 mg/l		1100	01/22/94	HB
Alkalinity Total as CaCO3.	425 mg/l	0.84	1100	01/22/94	HB
Chloride as Cl	59 mg/l	1.41	1400	01/26/94	HB
Sulfate as SO4	943 mg/l	2.29	1115	02/02/94	CC
CATIONS					
Calcium as Ca	110 mg/l	0.39	1600	02/04/94	BH
Hardness as CaCO3	850 mg/l		1600	02/04/94	BH
Magnesium as Mg	140 mg/l	0.31	0930	01/21/94	BH
Potassium as K	10 mg/l	0.18	1400	01/28/94	AH
Sodium as Na	298 mg/l	0.81	1600	02/04/94	BH
INORGANICS					
Oil & Grease	2 mg/l	0.9	1030	01/27/94	TK
Settleable Solids	<0.1 ml/l	0.1	1045	01/19/94	CC
Total Dissolved Solids	1780 mg/l	11.7	1720	01/20/94	HB
Total Suspended Solids	11 mg/l	3.5	1300	01/21/94	HB
METALS					
Aluminum as Al (Dissolved	* <0.5 mg/l	0.023	1400	02/03/94	BH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	0930	01/20/94	AH
Boron as B (Dissolved)	* <0.5 mg/l	0.045	1100	02/03/94	BH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1100	01/27/94	BH
Copper as Cu (Dissolved)	* <0.10 mg/l	0.005	1100	02/03/94	BH
Iron as Fe (Dissolved)	* <0.25 mg/l	0.008	1100	02/03/94	BH
Iron as Fe (Total)	0.30 mg/l	0.008	1630	02/03/94	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1300	01/20/94	AH
Manganese as Mn (Dissolve	* <0.10 mg/l	0.003	1100	02/03/94	BH
Manganese as Mn (Total)	* <0.10 mg/l	0.003	1630	02/03/94	BH
Molybdenum as Mo (Dissolv	* <0.25 mg/l	0.023	1100	02/03/94	BH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1130	01/21/94	AH
Zinc as Zn (Dissolved)	* <0.10 mg/l	0.008	1100	02/03/94	BH

* Higher detection limit is due to interference present in the sample.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148527
Sample Name: ICE-1/0113394
Sample Date: 01/13/94
Collected by: GREG McDONALD
Time Sampled: 1454
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
NUTRIENTS					
Ammonia Nitrogen as N	0.13 mg/l	0.034	1515	01/24/94	CC
Nitrite as N	<0.05 mg/l	0.005	1200	01/20/94	DD
Phosphorous Total	0.05 mg/l	0.002	1600	02/09/94	CC
Nitrate as N	0.69 mg/l	0.005	1015	01/28/94	CC

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148528
Sample Name: ICE-2/011394
Sample Date: 01/13/94
Collected by: GREG McDONALD
Time Sampled: 1459
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as	530 mg/l		1100	01/22/94	HB
Alkalinity Carbonate as C	0 mg/l		1100	01/22/94	HB
Alkalinity Total as CaCO3	434 mg/l	0.84	1100	01/22/94	HB
Chloride as Cl	59 mg/l	1.41	1400	01/26/94	HB
Sulfate as SO4	943 mg/l	2.29	1115	02/02/94	CC
CATIONS					
Calcium as Ca	110 mg/l	0.39	1600	02/04/94	BH
Hardness as CaCO3	850 mg/l		0930	01/21/94	BH
Magnesium as Mg	140 mg/l	0.31	0930	01/21/94	BH
Potassium as K	12 mg/l	0.18	1400	01/28/94	AH
Sodium as Na	296 mg/l	0.81	1600	02/04/94	BH
INORGANICS					
Oil & Grease	<1 mg/l	0.9	1030	01/27/94	TK
Settleable Solids	<0.1 ml/l	0.1	1045	01/19/94	CC
Total Dissolved Solids	1740 mg/l	11.7	1720	01/20/94	HB
Total Suspended Solids	7 mg/l	3.5	1300	01/21/94	HB
METALS					
Aluminum as Al (Dissolved	* <0.5 mg/l	0.023	1400	02/03/94	BH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	0930	01/20/94	AH
Boron as B (Dissolved)	* <0.5 mg/l	0.045	1100	02/03/94	BH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1100	01/27/94	BH
Copper as Cu (Dissolved)	* <0.10 mg/l	0.005	1100	02/03/94	BH
Iron as Fe (Dissolved)	* <0.25 mg/l	0.008	1100	02/03/94	BH
Iron as Fe (Total)	0.35 mg/l	0.008	1630	02/03/94	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1300	01/20/94	AH
Manganese as Mn (Dissolved)	* <0.10 mg/l	0.003	1100	02/03/94	BH
Manganese as Mn (Total)	* <0.10 mg/l	0.003	1630	02/03/94	BH
Molybdenum as Mo (Dissolved)	* <0.25 mg/l	0.023	1100	02/03/94	BH
Selenium as Se (Dissolved)	<0.002 mg/l	0.0011	1130	01/21/94	AH
Zinc as Zn (Dissolved)	* <0.10 mg/l	0.008	1100	02/03/94	BH

* Higher detection limit is due to interference present in the sample.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148528
Sample Name: ICE-2/011394
Sample Date: 01/13/94
Collected by: GREG McDONALD
Time Sampled: 1459
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
NUTRIENTS					
Ammonia Nitrogen as N	0.11 mg/l	0.034	1515	01/24/94	CC
Nitrite as N	<0.05 mg/l	0.005	1200	01/20/94	DD
Phosphorous Total	0.05 mg/l	0.002	1600	02/09/94	CC
Nitrate as N	0.71 mg/l	0.005	1015	01/28/94	CC

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148529
Sample Name: DUPLICATE 148524 CRS/011494
Sample Date: 01/14/94
Collected by: GREG McDONALD
Time Sampled: 1035
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Bicarbonate as	547 mg/l		1100	01/22/94	HB
Alkalinity Carbonate as C	0 mg/l		1100	01/22/94	HB
Alkalinity Total as CaCO3	448 mg/l	0.84	1100	01/22/94	HB
Chloride as Cl	103 mg/l	1.41	1400	01/26/94	HB
Sulfate as SO4	3160 mg/l	2.29	1115	02/02/94	CC
CATIONS					
Calcium as Ca	560 mg/l	0.39	1600	02/04/94	BH
Hardness as CaCO3	2800 mg/l		0930	01/21/94	BH
Magnesium as Mg	340 mg/l	0.31	1600	02/04/94	BH
Potassium as K	56 mg/l	0.18	1400	01/28/94	AH
Sodium as Na	525 mg/l	0.81	1600	02/04/94	BH
INORGANICS					
Total Dissolved Solids	5100 mg/l	11.7	1720	01/20/94	HB
Total Suspended Solids	62 mg/l	3.5	1300	01/21/94	HB
METALS					
Aluminum as Al (Dissolved	* <0.5 mg/l	0.023	1400	02/03/94	BH
Arsenic as As (Dissolved)	0.005 mg/l	0.0014	0930	01/20/94	AH
Boron as B (Dissolved)	1.2 mg/l	0.045	1100	02/03/94	BH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1100	01/27/94	BH
Copper as Cu (Dissolved)	* <0.10 mg/l	0.005	1100	02/03/94	BH
Iron as Fe (Dissolved)	12 mg/l	0.008	1100	02/03/94	BH
Iron as Fe (Total)	20 mg/l	0.008	1630	02/03/94	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1300	01/20/94	AH
Manganese as Mn (Dissolve	0.32 mg/l	0.003	1500	02/25/94	BH
Manganese as Mn (Total)	0.60 mg/l	0.003	1500	02/25/94	BH
Molybdenum as Mo (Dissolv	* <0.25 mg/l	0.023	1100	02/03/94	BH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1130	01/21/94	AH
Zinc as Zn (Dissolved)	* <0.10 mg/l	0.008	1100	02/03/94	BH

* Higher detection limit is due to interference present in the sample.

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148529
Sample Name: DUPLICATE 148524 CRS/011494
Sample Date: 01/14/94
Collected by: GREG McDONALD
Time Sampled: 1035
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
NUTRIENTS					
Ammonia Nitrogen as N	2.13 mg/l	0.034	1515	01/24/94	CC
Nitrite as N	<0.05 mg/l	0.005	1200	01/20/94	DD
Phosphorous Total	0.75 mg/l	0.002	1600	02/09/94	CC
Nitrate as N	0.26 mg/l	0.005	1015	01/28/94	CC

Client Name: CHEN-NORTHERN, INC. SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 148530
Sample Name: SPIKE 148528 ICE-2/011394
Sample Date: 01/13/94
Collected by: GREG McDONALD
Time Sampled: 1459
Sample Type: SURFACE WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS					
Alkalinity Total as CaCO3	96 %	0.84	1100	01/22/94	HB
Chloride as Cl	102 %	1.41	1400	01/26/94	HB
Sulfate as SO4	101 %	2.29	1115	02/02/94	CC
CATIONS					
Calcium as Ca	100 %	0.39	0930	01/21/94	BH
Magnesium as Mg	98 %	0.31	0930	01/21/94	BH
Potassium as K	100 %	0.18	1400	01/28/94	AH
Sodium as Na	99 %	0.81	0930	01/21/94	BH
METALS					
Aluminum as Al (Dissolved	100 %	0.023	1400	02/03/94	BH
Arsenic as As (Dissolved)	100 %	0.0014	0930	01/20/94	AH
Boron as B (Dissolved)	103 %	0.045	1100	02/03/94	BH
Cadmium as Cd (Dissolved)	100 %	0.0002	1100	01/27/94	BH
Copper as Cu (Dissolved)	94 %	0.005	1100	02/03/94	BH
Iron as Fe (Dissolved)	105 %	0.008	1100	02/03/94	BH
Iron as Fe (Total)	93 %	0.008	1630	02/03/94	BH
Lead as Pb (Dissolved)	100 %	0.0012	1300	01/20/94	AH
Manganese as Mn (Dissolve	102 %	0.003	1100	02/03/94	BH
Manganese as Mn (Total)	100 %	0.003	1630	02/03/94	BH
Molybdenum as Mo (Dissolv	91 %	0.023	1100	02/03/94	BH
Selenium as Se (Dissolved	92 %	0.0011	1130	01/21/94	AH
Zinc as Zn (Dissolved)	104 %	0.008	1100	02/03/94	BH
NUTRIENTS					
Ammonia Nitrogen as N	95 %	0.034	1515	01/24/94	CC
Nitrite as N	107 %	0.005	1200	01/20/94	DD
Phosphorous Total	100 %	0.002	1600	02/09/94	CC
Nitrate as N	104 %	0.005	1015	01/28/94	CC

Huntingdon
Consulting Engineers & Environmental Scientists

Chen-Northern, Inc., Division
600 South 25th Street
Box 30615
Billings Montana 59107
(406)248-9161
Fax: (406)248-9282

March 15, 1994

Huntingdon Chen-Northern, Inc.
1127 West 2320 South, Suite B
Salt Lake City UT 84119

ATTENTION: Chuck Wemple

Dear Chuck,

The cation-anion balances for the last set of water samples from the Sunnyside Cogeneration Plant are as follows:

		Cations (meq/l)	Anions (meq/l)	Difference
148524	CRS/011494	80.41	78.29	2.13
148525	CRB-011494	68.89	67.35	1.54
148526	F-2/011394	25.23	24.33	0.90
148527	ICE-1/011394	30.23	29.81	0.42
148528	ICE-2/011394	30.19	29.99	0.21
148529	CRS/011494 Dup	80.20	77.66	2.54
148511	MW-1/011394	35.25	34.43	0.81
148512	MW-2/011394	28.36	27.50	0.86
148513	MW-3/011394	25.51	25.40	0.11
148514	WS/011394	24.39	23.48	0.91
148515	WSB/011394	24.87	24.12	0.75
148516	GWB/011394	0.20	0.15	0.05
148517	MW-1/011394	35.75	34.75	1.00

We will include the cation-anion balance on your next group of samples. This calculation is a quality control mechanism to measure the accuracy of major cations and anions. Water is electrically neutral meaning that the cations and anions, when expressed in milliequivalents per liter, should be roughly the same. For the balance, we use the four major cations - calcium, magnesium, sodium, and potassium. Major anions include alkalinity (total), chloride, and sulfate. Fluoride and nitrate are also used if results are available. To convert mg/l to meq/l for each cation and anion, divide the mg/l reading by the following values:

Calcium	20.04	Alkalinity	50.00
Magnesium	12.16	Chloride	35.46
Sodium	23.00	Sulfate	48.03
Potassium	39.10	Nitrate	62.00
		Fluoride	19.00

Naturally, there may be other cations and anions not used in this equation, but in most cases they are in insignificant amounts. Occasionally, a sample will not "balance" after we rerun and verify our results, and in those cases, we will cite on the report that the problem may be in unmeasured cations and anions.

If you need additional information, let me know.

Sincerely,

HUNTINGDON CHEN-NORTHERN, INC.

David Councill

David Councill

DC:dg

cwo315.n.corres.councill

SCA OGM
Project or Site Name

S-137.3-91
Project Number

Greg McDonald
Sampler Name (Printed)

CHAIN OF CUSTODY RECORD

Huntingdon
Consulting Engineers & Environmental Scientists

- [x] Chen-Northern, Inc., Division
- [ ] Thomas-Hartig & Associates, Inc., Division
- [ ] Schaefer Dixon Associates, Inc., Division
- [ ] Herzog Associates, Inc., Division

Chuck Wemple
Contact or Report to

SLC, UT
Contact Address or Location

Sampler Signature

DATE COLLECTED	TIME COLLECTED	SAMPLE LOCATION OR DESCRIPTION	COMP OR GRAB	SAMPLE MATRIX	NO. OF CONTAINERS	ANALYSIS REQUIRED (See Attached List)	NOTES	LAB NUMBER
							pH	
1/14/94	1035	CRS/011494	Grab	Water	6		2	148594-1
1/14/94	1130	CRB/011494	Grab	Water	6		2	2-5
1/13/94	1600	F-2/011394	Grab	Water	6		2	2-6
1/13/94	1454	ICE-1/011394	Grab	Water	6		2	2-7
1/13/94	1459	ICE-2/011394	Grab	Water	6		2	2-8
								2-9
								2-10

CP 148594 CRS/011494 1/14 1035
SP 148598 ICE-2/011594 1/13 1459

	Date	Time	Received by:
Relinquished by:	1/17/94	1400	Carrier / [illegible]
Relinquished by:	1/18/94	1430	[illegible]
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:

Remarks:
Attn: Dave Council

1142 Cooler temp 6.1°C.
SLC Cooler temp 3.8°C.

Huntingdon
(Formerly Chen-Northern, Inc.)
600 South 25th Street
O Box 30615
llings, MT 59107
(406) 248-9161
FAX (406) 248-9282

TECHNICAL REPORT

REPORT TO: ATTN: CHUCK WEMPLE
HUNTINGDON ENGINEERING &
ENVIRONMENTAL, INC.
1127 WEST 2320 SOUTH, SUITE B
SALT LAKE CITY UT 84119

DATE: June 1, 1994
JOB NUMBER: 87-927
SHEET: 1 of 5
INVOICE NO.: 026670

REPORT OF: Water Analysis - SCA DOGM (5-137.4-91)

SAMPLE IDENTIFICATION:

On April 21, 1994, these water samples (our laboratory numbers 150822 through 150825) were received in our laboratory for analysis. Tests were conducted in accordance with the U.S. Environmental Protection Agency Manual EPA 600/4-79-029 *"Methods for Chemical Analysis of Water and Wastes."*

The condition of the samples upon receipt at the laboratory is noted on the attached sample receipt checklist.

The test results are shown on the following pages.

A < sign indicates the value reported was the practical quantitation limit for this sample using the method described. Concentrations of analyte, if present, below this were not quantifiable.

Reviewed by

Attachment: Sample Receipt Checklist

rmr

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 150822
Sample Name: CRS/041994
Sample Date: 04/19/94
Collected by: CHUCK WEMPLE
Time Sampled: 1415
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS**	73.58 meq/l				
Alkalinity Bicarbonate as HCO3	553 mg/l	-	1400	05/03/94	CC
Alkalinity Carbonate as CO3	0 mg/l	-	1400	05/03/94	CC
Alkalinity Total as CaCO3	453 mg/l	0.84	1400	05/03/94	CC
Chloride as Cl	101 mg/l	1.41	1530	04/27/94	CC
Sulfate as SO4	2960 mg/l	2.29	1400	05/23/94	DD
CATIONS**	80.38 meq/l				
Calcium as Ca	558 mg/l	0.39	1000	05/11/94	BH
Hardness as CaCO3	2890 mg/l	-	1000	05/11/94	BH
Magnesium as Mg	350 mg/l	0.31	1030	05/04/94	BH
Potassium as K	52 mg/l	0.18	1000	05/09/94	BH
Sodium as Na	515 mg/l	0.81	1000	04/25/94	AH
INORGANICS					
Electrical Conductivity	5550 umhos/cm	7	1300	04/27/94	HB
Oil & Grease	4 mg/l	0.9	1630	05/02/94	CC
Settleable Solids	<0.1 ml/l	0.1	1600	04/21/94	DD
Total Dissolved Solids	4890 mg/l	11.7	1400	04/26/94	HB
Total Suspended Solids	34 mg/l	3.5	1400	04/26/94	HB
METALS					
Aluminum as Al (Dissolved	*<1.0 mg/l	0.023	1330	05/04/94	BH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1400	05/02/94	AH
Boron as B (Dissolved)	*<1 mg/l	0.045	1030	05/05/94	BH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1400	04/29/94	AH
Copper as Cu (Dissolved)	*<0.2 mg/l	0.005	1330	05/04/94	BH
Iron as Fe (Dissolved)	4.63 mg/l	0.008	1030	05/06/94	BH
Iron as Fe (Total)	11.0 mg/l	0.008	1400	05/06/94	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1400	04/28/94	AH
Manganese as Mn (Dissolved)	1.90 mg/l	0.003	1330	05/04/94	BH
Manganese as Mn (Total)	1.65 mg/l	0.003	1515	05/06/94	BH
Molybdenum as Mo (Dissolved)	*<0.5 mg/l	0.023	1330	05/04/94	BH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	05/04/94	AH
Zinc as Zn (Dissolved)	*<0.2 mg/l	0.008	1330	05/04/94	BH
NUTRIENTS					
Ammonia Nitrogen as N	1.42 mg/l	0.034	1600	04/25/94	CC
Nitrate + Nitrite as N	<0.05 mg/l	0.05	1330	04/22/94	DD
Phosphorous Total	0.27 mg/l	0.002	1400	04/26/94	CC

* Higher detection level due to interference.
** The cation-anion analysis does not meet our quality assurance requirements. However, the values reported herein were verified by duplicate analysis. This indicates there are other unmeasured cations or anions present in the sample.

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 150823
Sample Name: CRB/041994
Sample Date: 04/19/94
Collected by: CHUCK WEMPLE
Time Sampled: 1430
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS**	64.86 meq/l				
Alkalinity Bicarbonate as HCO3	380 mg/l	-	1400	05/03/94	DD
Alkalinity Carbonate as CO3	0 mg/l	-	1400	05/03/94	DD
Alkalinity Total as CaCO3	311 mg/l	0.84	1400	05/03/94	DD
Chloride as Cl	134 mg/l	1.41	1530	04/27/94	DD
Sulfate as SO4	2630 mg/l	2.29	1400	05/23/94	DD
CATIONS**	70.68 meq/l				
Calcium as Ca	494 mg/l	0.39	1000	05/11/94	BH
Hardness as CaCO3	2666 mg/l	-	1000	05/11/94	BH
Magnesium as Mg	309 mg/l	0.31	1030	05/11/94	BH
Potassium as K	41 mg/l	0.18	1000	05/09/94	BH
Sodium as Na	450 mg/l	0.81	1000	04/25/94	AH
INORGANICS					
Electrical Conductivity	4960 umhos/cm	7	1300	04/27/94	HB
Oil & Grease	2 mg/l	0.9	1630	05/02/94	CC
Settleable Solids	<0.1 ml/l	0.1	1600	04/21/94	DD
Total Dissolved Solids	4620 mg/l	11.7	1400	04/26/94	HB
Total Suspended Solids	10 mg/l	3.5	1400	04/26/94	HB
METALS					
Aluminum as Al (Dissolved	*<1.0 mg/l	0.023	1330	05/04/94	BH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1400	05/02/94	AH
Boron as B (Dissolved)	* <1 mg/l	0.045	1030	05/05/94	BH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1400	04/29/94	AH
Copper as Cu (Dissolved)	*<0.2 mg/l	0.005	1330	05/04/94	BH
Iron as Fe (Dissolved)	*<0.5 mg/l	0.008	1030	05/06/94	BH
Iron as Fe (Total)	0.10 mg/l	0.008	1400	05/06/94	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.0012	1400	04/28/94	AH
Manganese as Mn (Dissolved)	0.20 mg/l	0.003	1330	05/04/94	BH
Manganese as Mn (Total)	<0.10 mg/l	0.003	1515	05/06/94	BH
Molybdenum as Mo (Dissolved)	* <0.5 mg/l	0.023	1330	05/04/94	BH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	05/04/94	AH
Zinc as Zn (Dissolved)	* <0.2 mg/l	0.008	1330	05/04/94	BH
NUTRIENTS					
Ammonia Nitrogen as N	<0.05 mg/l	0.034	1600	04/25/94	CC
Nitrate + Nitrite as N	0.73 mg/l	0.05	1330	04/22/94	DD
Phosphorous Total	0.02 mg/l	0.002	1400	04/26/94	CC

* Higher detection level due to interference.
** The cation-anion analysis does not meet our quality assurance requirements. However, the values reported herein were verified by duplicate analysis. This indicates there are other unmeasured cations or anions present in the sample.

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 150824
Sample Name: ICE-1/041994
Sample Date: 04/19/94
Collected by: CHUCK WEMPLE
Time Sampled: 1330
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS	29.84 meq/l				
Alkalinity Bicarbonate as HCO3	443 mg/l	-	1400	05/03/94	DD
Alkalinity Carbonate as CO3	11 mg/l	-	1400	05/03/94	DD
Alkalinity Total as CaCO3	382 mg/l	0.84	1400	05/03/94	DD
Chloride as Cl	60 mg/l	1.41	1530	04/27/94	DD
Sulfate as SO4	985 mg/l	2.29	1430	05/09/94	DD
CATIONS	30.19 meq/l				
Calcium as Ca	108 mg/l	0.39	1530	05/11/94	BH
Hardness as CaCO3	854 mg/l	-	1530	05/11/94	BH
Magnesium as Mg	142 mg/l	0.31	1530	05/11/94	BH
Potassium as K	13 mg/l	0.18	1000	05/09/94	AH
Sodium as Na	294 mg/l	0.81	1000	04/25/94	AH
INORGANICS					
Electrical Conductivity	2800 umhos/cm	7	1300	04/27/94	HB
Oil & Grease	<1 mg/l	0.9	1630	05/02/94	CC
Settleable Solids	<0.1 ml/l	0.1	1600	04/21/94	DD
Total Dissolved Solids	1860 mg/l	11.7	1400	04/26/94	HB
Total Suspended Solids	71 mg/l	3.5	1400	04/26/94	HB
METALS					
Aluminum as Al (Dissolved	*<1.0 mg/l	0.023	1330	05/04/94	BH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1400	05/02/94	AAH
Boron as B (Dissolved)	* <1 mg/l	0.045	1030	05/05/94	BH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1400	05/11/94	AH
Copper as Cu (Dissolved)	*<0.2 mg/l	0.005	1330	05/04/94	BH
Iron as Fe (Dissolved)	*<0.5 mg/l	0.008	1030	05/06/94	BH
Iron as Fe (Total)	0.35 mg/l	0.008	1400	05/06/94	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.012	1400	04/28/94	AH
Manganese as Mn (Dissolved)	*<0.2 mg/l	0.003	1330	05/04/94	BH
Manganese as Mn (Total)	0.10 mg/l	0.003	1515	05/06/94	BH
Molybdenum as Mo (Dissolved)	*<0.5 mg/l	0.023	1330	05/04/94	BH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	05/04/94	AH
Zinc as Zn (Dissolved)	*<0.2 mg/l	0.008	1330	05/04/94	BH
NUTRIENTS					
Ammonia Nitrogen as N	0.08 mg/l	0.034	1600	04/25/94	CC
Nitrate + Nitrite as N	0.32 mg/l	0.05	1330	04/22/94	DD
Phosphorous Total	0.02 mg/l	0.002	1400	04/26/94	CC

* Higher detection level due to interference.

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 150825
Sample Name: F-2/041994
Sample Date: 04/19/94
Collected by: CHUCK WEMPLE
Time Sampled: 1531
Sample Type: WATER

PARAMETER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS	**24.44 meq/l**				
Alkalinity Bicarbonate as HCO3	553 mg/l	-	1400	05/03/94	DD
Alkalinity Carbonate as CO3	11 mg/l	-	1400	05/03/94	DD
Alkalinity Total as CaCO3	472 mg/l	0.84	1400	05/03/94	DD
Chloride as Cl	56 mg/l	1.41	1530	05/17/94	DD
Sulfate as SO4	644 mg/l	2.29	1430	05/09/94	DD
CATIONS	**25.54 meq/l**				
Calcium as Ca	97 mg/l	0.39	1030	05/11/94	BH
Hardness as CaCO3	712 mg/l	-		05/11/94	
Magnesium as Mg	114 mg/l	0.31	1030	05/11/94	BH
Potassium as K	7 mg/l	0.18	1000	05/09/94	AH
Sodium as Na	274 mg/l	0.81	1000	05/11/94	AH
INORGANICS					
Electrical Conductivity	2280 umhos/cm	7	1300	04/27/94	HB
Oil & Grease	<1 mg/l	0.9	1630	05/02/94	CC
Settleable Solids	<0.1 ml/l	0.1	1600	04/21/94	DD
Total Dissolved Solids	1430 mg/l	11.7	1400	04/26/94	HB
Total Suspended Solids	7 mg/l	3.5	1400	04/26/94	HB
METALS					
Aluminum as Al (Dissolved	*<1.0 mg/l	0.023	1330	05/04/94	BH
Arsenic as As (Dissolved)	<0.002 mg/l	0.0014	1400	05/02/94	AH
Boron as B (Dissolved)	* <1 mg/l	0.045	1030	05/05/94	BH
Cadmium as Cd (Dissolved)	<0.001 mg/l	0.0002	1400	04/29/94	BH
Copper as Cu (Dissolved)	<0.2 mg/l	0.005	1330	05/04/94	BH
Iron as Fe (Dissolved)	*<0.5 mg/l	0.008	1030	05/06/94	BH
Iron as Fe (Total)	0.30 mg/l	0.008	1400	05/06/94	BH
Lead as Pb (Dissolved)	<0.002 mg/l	0.012	1400	04/28/94	AH
Manganese as Mn (Dissolved)	*<0.2 mg/l	0.003	1330	05/04/94	BH
Manganese as Mn (Total)	0.10 mg/l	0.003	1515	05/06/94	BH
Molybdenum as Mo (Dissolved)	*<0.5 mg/l	0.023	1330	05/04/94	BH
Selenium as Se (Dissolved	<0.002 mg/l	0.0011	1400	05/04/94	AH
Zinc as Zn (Dissolved)	*<0.2 mg/l	0.008	1330	05/04/94	BH
NUTRIENTS					
Ammonia Nitrogen as N	<0.05 mg/l	0.034	1600	04/25/94	CC
Nitrate + Nitrite as N	0.75 mg/l	0.05	1430	04/22/94	DD
Phosphorous Total	0.02 mg/l	0.002	1400	04/26/94	CC

* Higher detection level due to interference.

CHAIN OF CUSTODY RECORD

SCA DOGM
Project or Site Name

5-137.4-91
Project Number

Chuck Wample
Sampler Name (Printed)

Huntingdon
Consulting Engineers Environmental Scientists

- [x] Chen-Northern, Inc., Division
- [ ] Thomas-Hartig & Associates, Inc., Division
- [ ] Schaefer Dixon Associates, Inc., Division
- [ ] Herzog Associates, Inc., Division

Chuck Wample
Contact or Report to

SLC, UT
Contact Address or Location

Chuck Wample
Sampler Signature

DATE COLLECTED	TIME COLLECTED	SAMPLE LOCATION OR DESCRIPTION	COMP OR GRAB	SAMPLE MATRIX	NO. OF CONTAINERS	ANALYSIS REQUIRED (See Attached)	NOTES	LAB NUMBER
4/19/94	1415	CRS/041994	Grab	Water	6		Metals Filtered / metals unfiltered	150822
4/19/94	1430	CRB/041994	Grab	Water	6			23
4/19/94	1330	KE-1/041994	Grab	Water	6			24
4/19/94	1531	F-2/041994	Grab	Water	6			25

	Date	Time	Received by:
Relinquished by: Chuck Wample	04/20/94	1415	Carrier airborne
~~Relinquished by:~~	4/21/94	0920	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:

Remarks:
Metals filter
Rec'd
pH 3 — added HNO3 in lab to
pH < 2 ~~in~~ lab
SLC cooler temp 9°C
L92 cooler temp 11°C

Huntingdon
(Formerly Chen-Northern, Inc.)
600 South 25th Street
P O Box 30615
llings, MT 59107
406) 248-9161
FAX (406) 248-9282

TECHNICAL REPORT

REPORT TO: ATTN: GREG McDONALD
HUNTINGDON ENGINEERING &
ENVIRONMENTAL, INC.
1127 WEST 2320 SOUTH, SUITE B
SALT LAKE CITY UT 84119

DATE: July 20, 1994
JOB NUMBER: 87-927
SHEET: 1 of 6
INVOICE NO.: 025606

REPORT OF: Water Analysis - SCA DOGM (5-137.4-91)

SAMPLE IDENTIFICATION:

On June 24, 1994, these water samples (our laboratory numbers 152659 through 152663) were received in our laboratory for analysis. Tests were conducted in accordance with the U.S. Environmental Protection Agency Manual EPA 600/4-79-029 *"Methods for Chemical Analysis of Water and Wastes."*

The condition of the samples upon receipt at the laboratory is noted on the attached sample receipt checklist.

The test results are shown on the following pages.

A < sign indicates the value reported was the practical quantitation limit for this sample using the method described. Concentrations of analyte, if present, below this were not quantifiable.

Reviewed by David Connell

Attachment: Sample Receipt Checklist

mc

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 152659
Sample Name: ICE-1/062394
Sample Date: 06/23/94
Collected by: GREG McDONALD
Time Sampled: 1000
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3	310.1	541 mg/l		1500	06/29/94	HB
Alkalinity Carbonate as CO3	310.1	11 mg/l		1500	06/29/94	HB
Alkalinity Total as CaCO3	310.1	463 mg/l	0.43	1500	06/29/94	HB
Chloride as Cl	325.2	62 mg/l	0.72	0930	07/07/94	CC
Sulfate as SO4	375.2	782 mg/l	1.75	1400	07/13/94	CC
CATIONS						
Calcium as Ca	200.7	96 mg/l	0.10	1500	06/29/94	BH
Hardness as CaCO3	200.7	759 mg/l		1500	06/29/94	BH
Magnesium as Mg	200.7	126 mg/l	0.10	1500	06/29/94	BH
Potassium as K	258.1	11 mg/l	0.18	0930	07/01/94	BH
Sodium as Na	200.7	288 mg/l	0.81	1500	06/29/94	BH
INORGANICS						
Electrical Conductivity	120.1	2220 umhos/cm	7.3	1400	07/11/94	HB
Oil & Grease	413.1	<1 mg/l	0.946	1300	06/30/94	CC
Settleable Solids	160.5	<0.1 ml/l	0.1	1420	06/24/94	CC
Total Dissolved Solids	160.1	1590 mg/l	6.3	1500	06/28/94	HB
Total Suspended Solids	160.2	<4 mg/l	4	1500	06/27/94	HB
METALS						
Aluminum as Al (Dissolved)	200.7	<0.1 mg/l	0.02	1000	07/11/94	BH
Arsenic as As (Dissolved)	206.3	<0.002 mg/l	0.002	1500	07/05/94	AAH
Boron as B (Dissolved)	200.7	0.2 mg/l	0.02	1500	07/08/94	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.00009	1500	06/29/94	AH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1000	07/11/94	BH
Iron as Fe (Dissolved)	200.7	<0.05 mg/l	0.006	1115	07/08/94	BH
Iron as Fe (Total)	200.7	0.07 mg/l	0.006	1545	06/30/94	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1100	07/15/94	AH
Manganese as Mn (Dissolved)	200.7	<0.02 mg/l	0.001	1115	07/08/94	BH
Manganese as Mn (Total)	200.7	<0.02 mg/l	0.001	1545	06/30/94	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05 mg/l	0.009	1430	07/08/94	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.001	1500	07/08/94	AAH
Zinc as Zn (Dissolved)	200.7	<0.02 mg/l	0.002	1115	07/08/94	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	<0.05 mg/l	0.015	1130	07/08/94	DD
Nitrite as N	353.2	<0.05 mg/l	0.005	1710	06/24/94	CC
Phosphorous Total	365.1	0.03 mg/l	0.003	1430	06/30/94	DD
Nitrate as N	353.2	0.48 mg/l	0.004	1200	06/24/94	DD

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 152660
Sample Name: F-2/062394
Sample Date: 06/23/94
Collected by: GREG McDONALD
Time Sampled: 1030
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3	310.1	593 mg/l		1500	06/29/94	HB
Alkalinity Carbonate as CO3	310.1	11 mg/l		1500	06/29/94	HB
Alkalinity Total as CaCO3	310.1	505 mg/l	0.43	1500	06/29/94	HB
Chloride as Cl	325.2	56 mg/l	0.72	0930	07/07/94	CC
Sulfate as SO4	375.2	700 mg/l	1.75	1400	06/28/94	CC
CATIONS						
Calcium as Ca	200.7	108 mg/l	0.10	1500	06/29/94	BH
Hardness as CaCO3	200.7	738 mg/l		1030	07/14/94	BH
Magnesium as Mg	200.7	114 mg/l	0.10	1030	07/14/94	BH
Potassium as K	258.1	9 mg/l	0.18	0930	07/01/94	BH
Sodium as Na	200.7	273 mg/l	0.81	1500	06/29/94	BH
INORGANICS						
Electrical Conductivity	120.1	2280 umhos/cm	7.3	1400	07/11/94	HB
Oil & Grease	413.1	<1 mg/l	0.946	1300	06/30/94	CC
Settleable Solids	160.5	<0.1 ml/l	0.1	1420	06/24/94	CC
Total Dissolved Solids	160.1	1500 mg/l	6.3	1500	06/28/94	HB
Total Suspended Solids	160.2	<5 mg/l	4	1500	06/27/94	HB
METALS						
Aluminum as Al (Dissolved)	200.7	<0.1 mg/l	0.02	1000	07/11/94	BH
Arsenic as As (Dissolved)	206.3	<0.002 mg/l	0.002	1500	07/05/94	AH
Boron as B (Dissolved)	200.7	0.2 mg/l	0.02	1500	07/08/94	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.00009	1500	06/29/94	AAH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1000	07/11/94	BH
Iron as Fe (Dissolved)	200.7	<0.05 mg/l	0.006	1115	07/08/94	BH
Iron as Fe (Total)	200.7	0.54 mg/l	0.001	1545	06/30/94	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1100	07/15/94	AAH
Manganese as Mn (Dissolved)	200.7	<0.02 mg/l	0.001	1115	07/08/94	BH
Manganese as Mn (Total)	200.7	<0.02 mg/l	0.001	1545	06/30/94	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05 mg/l	0.009	1430	07/08/94	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.001	1500	07/08/94	AAH
Zinc as Zn (Dissolved)	200.7	<0.02 mg/l	0.002	1115	07/08/94	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	<0.05 mg/l	0.015	1130	07/08/94	DD
Nitrite as N	353.2	<0.05 mg/l	0.005	1710	06/24/94	CC
Phosphorous Total	365.1	0.02 mg/l	0.003	1430	06/30/94	CC
Nitrate as N	353.2	0.94 mg/l	0.004	1200	06/24/94	DD

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 152661
Sample Name: CRS/062394
Sample Date: 06/23/94
Collected by: GREG McDONALD
Time Sampled: 1110
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS *						
Alkalinity Bicarbonate as HCO3	310.1	559 mg/l		1500	06/29/94	HB
Alkalinity Carbonate as CO3	310.1	0 mg/l		1500	06/29/94	HB
Alkalinity Total as CaCO3	310.1	458 mg/l	0.43	1500	06/29/94	HB
Chloride as Cl	325.2	105 mg/l	0.72	0930	07/07/94	CC
Sulfate as SO4	375.2	3080 mg/l	1.75	1300	06/29/94	CC
CATIONS *						
Calcium as Ca	200.7	597 mg/l	0.10	1500	06/29/94	BH
Hardness as CaCO3	200.7	2980 mg/l		1500	06/29/94	BH
Magnesium as Mg	200.7	363 mg/l	0.10	1500	06/29/94	BH
Potassium as K	258.1	57 mg/l	0.18	0930	07/01/94	BH
Sodium as Na	200.7	501 mg/l	0.81	1500	06/29/94	BH
INORGANICS						
Electrical Conductivity	120.1	5280 umhos/cm	7.3	1400	07/11/94	HB
Oil & Grease	413.1	<1 mg/l	0.946	1300	06/30/94	CC
Settleable Solids	160.5	<0.1 ml/l	0.1	1420	06/24/94	CC
Total Dissolved Solids	160.1	4910 mg/l	6.3	1500	06/28/94	HB
Total Suspended Solids	160.2	14 mg/l	4	1500	06/27/94	HB
METALS						
Aluminum as Al (Dissolved)	200.7	0.2 mg/l	0.02	1000	07/11/94	BH
Arsenic as As (Dissolved)	206.3	0.002 mg/l	0.002	1500	07/05/94	AAH
Boron as B (Dissolved)	200.7	0.6 mg/l	0.02	1500	07/08/94	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.00009	1500	06/29/94	AAH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1000	07/11/94	BH
Iron as Fe (Dissolved)	0.006	9.5 mg/l	0.006	1115	07/08/94	BH
Iron as Fe (Total)	200.7	10.4 mg/l	0.001	1545	06/30/94	BH
Lead as Pb (Dissolved)	0.001	<0.002 mg/l	0.001	1100	07/15/94	AAH
Manganese as Mn (Dissolved)	0.001	1.08 mg/l	0.001	1130	07/11/94	BH
Manganese as Mn (Total)	0.001	1.56 mg/l	0.001	1415	07/13/94	BH
Molybdenum as Mo (Dissolved)	0.009	<0.05 mg/l	0.009	1430	07/08/94	BH
Selenium as Se (Dissolved)	0.001	<0.002 mg/l	0.001	1500	07/08/94	AAH
Zinc as Zn (Dissolved)	0.002	<0.02 mg/l	0.002	1115	07/08/94	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	1.26 mg/l	0.015	1130	07/08/94	DD
Nitrite as N	353.2	<0.05 mg/l	0.005	1710	06/24/94	CC
Phosphorous Total	365.1	0.17 mg/l	0.003	1730	07/14/94	CC
Nitrate as N	353.2	0.37 mg/l	0.004	1200	06/24/94	DD

* The cation-anion analysis does not meet our quality assurance requirements. However, the values reported herein were verified by duplicate analysis. This indicates there are other unmeasured cations or anions present in the sample.

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 152662
Sample Name: CRB-062394
Sample Date: 06/23/94
Collected by: GREG McDONALD
Time Sampled: 1130
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3	310.1	398 mg/l			07/08/94	HB
Alkalinity Carbonate as CO3	310.1	0 mg/l			07/08/94	HB
Alkalinity Total as CaCO3	310.1	326 mg/l	0.43	1300	07/08/94	HB
Chloride as Cl	325.2	166 mg/l	0.72	0930	07/07/94	CC
Sulfate as SO4	375.2	2820 mg/l	1.75	1300	06/29/94	CC
CATIONS						
Calcium as Ca	200.7	480 mg/l	0.10	1030	07/14/94	BH
Hardness as CaCO3	200.7	2470 mg/l		1030	07/14/94	BH
Magnesium as Mg	200.7	310 mg/l	0.10	1030	07/14/94	BH
Potassium as K	258.1	48 mg/l	0.18	0930	07/01/94	BH
Sodium as Na	200.7	475 mg/l	0.81	1030	07/14/94	BH
INORGANICS						
Electrical Conductivity	120.1	5160 umhos/cm	7.3	1400	07/11/94	HB
Oil & Grease	413.1	<1 mg/l	0.946	1300	06/30/94	CC
Settleable Solids	160.5	<0.1 ml/l	0.1	1530	06/24/94	CC
Total Dissolved Solids	160.1	4490 mg/l	6.3	1500	06/28/94	HB
Total Suspended Solids	160.2	<5 mg/l	4	1500	06/27/94	HB
METALS						
Aluminum as Al (Dissolved)	200.7	<0.1 mg/l	0.02	1000	07/11/94	BH
Arsenic as As (Dissolved)	206.3	<0.002 mg/l	0.002	1500	07/05/94	AAH
Boron as B (Dissolved)	200.7	0.6 mg/l	0.02	1500	07/08/94	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.00009	1500	06/29/94	AAH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1000	07/11/94	BH
Iron as Fe (Dissolved)	200.7	<0.25 * mg/l	0.006	1115	07/08/94	BH
Iron as Fe (Total)	200.7	<0.15 * mg/l	0.008	1545	06/30/94	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1100	07/15/94	AAH
Manganese as Mn (Dissolved)	200.7	<0.10 * mg/l	0.001	1115	07/08/94	BH
Manganese as Mn (Total)	200.7	<0.06 * mg/l	0.001	1545	06/30/94	BH
Molybdenum as Mo (Dissolved)	200.7	0.07 mg/l	0.009	1430	07/08/94	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.001	1500	07/08/94	AAH
Zinc as Zn (Dissolved)	200.7	0.03 mg/l	0.002	1115	07/08/94	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	<0.05 mg/l	0.015	1130	07/08/94	DD
Nitrite as N	353.2	<0.05 mg/l	0.005	1710	06/24/94	CC
Phosphorous Total	365.1	0.04 mg/l	0.003	1430	06/30/94	DD
Nitrate as N	353.2	0.44 mg/l	0.004	1200	06/24/94	DD

* Higher detection limit reported due to interferences present in the sample.

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 152663
Sample Name: WELL-1/062394
Sample Date: 06/23/94
Collected by: GREG McDONALD
Time Sampled: 1210
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3	310.1	593 mg/l		1500	06/29/94	HB
Alkalinity Carbonate as CO3	310.1	0 mg/l		1500	06/29/94	HB
Alkalinity Total as CaCO3	310.1	486 mg/l	0.43	1500	06/29/94	HB
Chloride as Cl	325.2	33 mg/l	0.72	0930	07/07/94	CC
Sulfate as SO4	375.2	479 mg/l	1.75	1400	07/13/94	CC
CATIONS						
Calcium as Ca	200.7	78 mg/l	0.10	1030	07/14/94	BH
Hardness as CaCO3	200.7	515 mg/l		1030	07/14/94	BH
Magnesium as Mg	200.7	78 mg/l	0.10	1030	07/14/94	BH
Potassium as K	258.1	7 mg/l	0.18	0930	07/01/94	BH
Sodium as Na	200.7	234 mg/l	0.81	1030	07/14/94	BH
INORGANICS						
Electrical Conductivity	120.1	1830 umhos/cm	7.3	1400	07/11/94	HB
Oil & Grease	413.1	2 mg/l	0.946	1300	06/30/94	CC
Settleable Solids	160.5	<0.1 ml/l	0.1	1530	06/24/94	CC
Total Dissolved Solids	160.1	1180 mg/l	6.3	1500	06/28/94	HB
Total Suspended Solids	160.2	<5 mg/l	4	1500	06/27/94	HB
METALS						
Aluminum as Al (Dissolved)	200.7	<0.1 mg/l	0.02	1000	07/11/94	BH
Arsenic as As (Dissolved)	206.3	<0.002 mg/l	0.002	1500	07/05/94	AAH
Boron as B (Dissolved)	200.7	0.1 mg/l	0.02	1500	07/08/94	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.00009	1500	06/29/94	AAH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1000	07/11/94	BH
Iron as Fe (Dissolved)	200.7	<0.05 mg/l	0.006	1115	07/08/94	BH
Iron as Fe (Total)	200.7	0.10 mg/l	0.001	1545	06/30/94	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1100	07/15/94	AAH
Manganese as Mn (Dissolved)	200.7	<0.02 mg/l	0.001	1115	07/08/94	BH
Manganese as Mn (Total)	200.7	<0.02 mg/l	0.001	1545	06/30/94	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05 mg/l	0.009	1430	07/08/94	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.001	1500	07/08/94	AAH
Zinc as Zn (Dissolved)	200.7	<0.02 mg/l	0.002	1115	07/08/94	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	<0.05 mg/l	0.015	1130	07/08/94	DD
Nitrite as N	352.2	<0.05 mg/l	0.005	1710	06/24/94	CC
Phosphorous Total	365.1	<0.02 mg/l	0.003	1530	06/30/94	DD
Nitrate as N	353.2	0.85 mg/l	0.004	1200	06/24/94	DD

SCA DOGM

Project or Site Name

S-137.4-91

Project Number

Greg McDonald

Sampler Name (Printed)

CHAIN OF CUSTODY RECORD

Huntingdon
Consulting Engineers Environmental Scientists

- ☑ Chen-Northern, Inc., Division
- ☐ Thomas-Hartig & Associates, Inc., Division
- ☐ Schaefer Dixon Associates, Inc., Division
- ☐ Herzog Associates, Inc., Division

Rich Grand / GM

Contact or Report to

1127 W. 2320 S. SLC UT.

Contact Address or Location

Sampler Signature

DATE COLLECTED	TIME COLLECTED	SAMPLE LOCATION OR DESCRIPTION	COMP OR GRAB	SAMPLE MATRIX	NO. OF CONTAINERS	ANALYSIS REQUIRED (See Attached List)	NOTES	LAB NUMBER
6/23/94	1000	ICE-1/062394	Grab	Water	6			152659
6/23/94	1030	F-2/062394	Grab	Water	6			60
6/23/94	1110	CRS/062394	Grab	Water	6			61
6/23/94	1130	CRB/062394	Grab	Water	6			62
6/23/94	1210	WELL-1/062394	Grab	Water	6			63

Relinquished by:	Date 6/23/94	Time 1530	Received by: Carrie Fel
Relinquished by:	Date 6/24/94	Time 0930	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:

Remarks:

Attn: Dave Council

*Please Note Nitrite Parm (Cie holding time)

Cooler temp 9°C

UTAH DIVISION OIL, GAS AND MINING
INCORPORATED
EFFECTIVE
6 1995

Huntingdon
(Formerly Chen-Northern, Inc.)
600 South 25th Street
O Box 30615
illings, MT 59107
(406) 248-9161
FAX (406) 248-9282

TECHNICAL REPORT

REPORT TO: ATTN: RICH GIRAUD
HUNTINGDON ENGINEERING &
ENVIRONMENTAL, INC.
1127 WEST 2320 SOUTH, SUITE B
SALT LAKE CITY UT 84119

DATE: October 21, 1994
JOB NUMBER: 87-927
SHEET: 1 of 6
INVOICE NO.: 027251

REPORT OF: Water Analysis - Sunnyside/DOGM 5-137.3-91

SAMPLE IDENTIFICATION:

On September 28, 1994, these water samples (laboratory numbers 155249 through 155253) were received in our laboratory for analysis. Tests were conducted in accordance with the U.S. Environmental Protection Agency Manual EPA 600/4-79-020 *"Methods for Chemical Analysis of Water and Wastes."*

The condition of the samples upon receipt at the laboratory is noted on the attached sample receipt checklist.

The test results are shown on the following pages.

A < sign indicates the value reported was the practical quantitation limit for this sample using the method described. Concentrations of analyte, if present, below this were not quantifiable.

Reviewed by David Commit

Attachments: Sample Receipt Checklist

rmr

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 155249
Sample Name: ICE-1
Sample Date: 09/27/94
Collected by: RICHARD E. GIRAUD
Time Sampled: NONE GIVEN
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3	310.1	509 mg/l	-	1400	10/03/94	HB
Alkalinity Carbonate as CO3	310.1	17 mg/l	-	1400	10/03/94	HB
Alkalinity Total as CaCO3	310.1	446 mg/l	0.43	1400	10/03/94	HB
Chloride as Cl	325.3	67 mg/l	0.37	1400	10/12/94	HB
Sulfate as SO4	375.2	742 mg/l	1.75	1130	09/30/94	CC
CATIONS						
Calcium as Ca	200.7	60 mg/l	0.10	1030	10/14/94	BH
Hardness as CaCO3	2340B	618 mg/l	-	1030	10/14/94	BH
Magnesium as Mg	200.7	114 mg/l	0.10	1030	10/14/94	BH
Potassium as K	258.1	6 mg/l	0.18	1300	10/07/94	AAH
Sodium as Na	200.7	320 mg/l	0.81	1030	10/14/94	BH
INORGANICS						
Electrical Conductivity	120.1	2350 umhos/cm	7.3	1400	10/05/94	HB
Oil & Grease	413.1	<1 mg/l	0.9	0730	10/10/94	CC
Settleable Solids	160.5	<0.1 ml/l	-	1440	09/28/94	TK
Total Dissolved Solids	160.1	1580 mg/l	6.3	0930	10/05/94	TK
Total Suspended Solids	160.2	7 mg/l	5.4	1000	10/03/94	TK
METALS						
Aluminum as Al (Dissolved)	200.7	0.3 mg/l	0.02	1100	10/03/94	BH
Arsenic as As (Dissolved)	206.3	<0.002 mg/l	0.002	1300	10/06/94	AAH
Boron as B (Dissolved)	200.7	0.2 mg/l	0.02	1510	10/07/94	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.0009	1100	10/10/94	BH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1100	10/03/94	BH
Iron as Fe (Dissolved)	200.7	<0.05 mg/l	0.006	1430	10/07/94	BH
Iron as Fe (Total)	200.7	0.16 mg/l	0.006	0950	10/11/94	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1400	10/11/94	AAH
Manganese as Mn (Dissolved)	200.7	<0.02 mg/l	0.001	1430	10/07/94	BH
Manganese as Mn (Total)	200.7	<0.02 mg/l	0.001	0950	10/11/94	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05 mg/l	0.009	1430	10/07/94	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.001	1500	10/05/94	AAH
Zinc as Zn (Dissolved)	200.7	<0.02 mg/l	0.002	1430	10/07/94	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	0.11 mg/l	0.015	1700	10/13/94	DD
Nitrite as N	354.2	<0.05 mg/l	0.005	1600	09/28/94	CC
Phosphorous Total	365.1	0.02 mg/l	0.003	1330	10/12/94	CC
Nitrate as N	353.2	0.05 mg/l	0.004	1730	09/28/94	CC

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 155250
Sample Name: CRS
Collected by: RICHARD E. GIRAUD
Time Sampled: NONE GIVEN
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3	310.1	608 mg/l	-	1400	10/14/94	HB
Alkalinity Carbonate as CO3	310.1	0 mg/l	-	1400	10/14/94	HB
Alkalinity Total as CaCO3	310.1	498 mg/l	0.43	1400	10/14/94	HB
Chloride as Cl	325.3	106 mg/l	0.37	1400	10/12/94	HB
Sulfate as SO4	375.2	2930 mg/l	1.75	1130	09/30/94	CC
CATIONS						
Calcium as Ca	200.7	546 mg/l	0.10	0900	10/20/94	BH
Hardness as CaCO3	23408	2630 mg/l	-	0900	10/20/94	BH
Magnesium as Mg	200.7	309 mg/l	0.10	0900	10/20/94	BH
Potassium as K	258.1	39 mg/l	0.18	1300	10/07/94	BH
Sodium as Na	200.7	471 mg/l	0.81	1030	10/14/94	BH
INORGANICS						
Electrical Conductivity	120.1	5520 umhos/cm	7.3	1400	10/05/94	HB
Oil & Grease	413.1	<1 mg/l	0.9	1000	10/11/94	CC
Settleable Solids	160.5	<0.1 ml/l	-	1440	09/26/94	TK
Total Dissolved Solids	160.1	5410 mg/l	6.3	0930	10/06/94	TK
Total Suspended Solids	160.2	26 mg/l	5.4	1000	10/03/94	TK
METALS						
Aluminum as Al (Dissolved)	200.7	0.1 mg/l	0.02	1100	10/03/94	BH
Arsenic as As (Dissolved)	206.3	0.002 mg/l	0.002	1300	10/06/94	AAH
Boron as B (Dissolved)	200.7	1.0 mg/l	0.02	1510	10/07/94	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.0009	1100	10/10/94	BH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1100	10/03/94	BH
Iron as Fe (Dissolved)	200.7	8.40 mg/l	0.006	1000	12/30/94	BH
Iron as Fe (Total)	200.7	9.57 mg/l	0.006	1000	12/30/94	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1400	10/11/94	AAH
Manganese as Mn (Dissolved)	200.7	0.64 mg/l	0.001	1430	10/07/94	BH
Manganese as Mn (Total)	200.7	0.69 mg/l	0.001	0950	10/11/94	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05 mg/l	0.009	1430	10/07/94	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.002	1500	10/05/94	AAH
Zinc as Zn (Dissolved)	200.7	<0.02 mg/l	0.002	1430	10/07/94	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	1.33 mg/l	0.015	1700	10/13/94	DD
Nitrite as N	354.2	<0.05 mg/l	0.005	1600	09/28/94	CC
Phosphorous Total	365.1	0.15 mg/l	0.003	0945	10/13/94	CC
Nitrate as N	353.2	0.22 mg/l	0.004	1730	09/28/94	CC

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 155251
Sample Name: CRB
Sample Date: 09/27/94
Collected by: RICHARD E. GIRAUD
Time Sampled: NONE GIVEN
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3	310.1	405 mg/l	-	1400	10/03/94	HB
Alkalinity Carbonate as CO3	310.1	0 mg/l	-	1400	10/03/94	HB
Alkalinity Total as CaCO3	310.1	332 mg/l	0.43	1400	10/03/94	HB
Chloride as Cl	325.3	213 mg/l	0.37	1400	10/12/94	HB
Sulfate as SO4	375.2	2780 mg/l	1.75	1130	09/30/94	CC
CATIONS						
Calcium as Ca	200.7	486 mg/l	0.10	1130	10/20/94	BH
Hardness as CaCO3	23408	2460 mg/l	-	1130	10/20/94	BH
Magnesium as Mg	200.7	303 mg/l	0.10	1130	10/20/94	BH
Potassium as K	258.1	32 mg/l	0.18	1300	10/07/94	AAH
Sodium as Na	200.7	450 mg/l	0.61	1030	10/14/94	BH
INORGANICS						
Electrical Conductivity	120.1	5460 umhos/cm	7.8	1400	10/05/94	HB
Oil & Grease	413.1	<1 mg/l	0.9	1000	10/11/94	CC
Settleable Solids	160.5	<0.1 ml/l	-	1440	09/28/94	TK
Total Dissolved Solids	160.1	5230 mg/l	6.3	0930	10/05/94	TK
Total Suspended Solids	160.2	<5 mg/l	5.4	1000	10/03/94	TK
METALS						
Aluminum as Al (Dissolved)	200.7	0.3 mg/l	0.02	1100	10/03/94	BH
Arsenic as As (Dissolved)	206.3	<0.002 mg/l	0.002	1300	10/06/94	AAH
Boron as B (Dissolved)	200.7	0.8 mg/l	0.02	1510	10/07/94	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.0009	1100	10/10/94	BH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1100	10/03/94	BH
Iron as Fe (Dissolved)	200.7	<0.25 mg/l	0.006	1000	12/30/94	BH
Iron as Fe (Total)	200.7	<0.25 mg/l	0.006	1000	12/30/94	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1400	10/11/94	AAH
Manganese as Mn (Dissolved)	200.7	*<0.10 mg/l	0.001	1430	10/07/94	BH
Manganese as Mn (Total)	200.7	*<0.06 mg/l	0.001	0950	10/11/94	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05 mg/l	0.009	1430	10/07/94	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.002	1500	10/05/94	AAH
Zinc as Zn (Dissolved)	200.7	<0.02 mg/l	0.002	1430	10/07/94	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	<0.05 mg/l	0.015	1700	10/13/94	DD
Nitrite as N	354.2	<0.05 mg/l	0.005	1600	09/28/94	CC
Phosphorous Total	365.1	0.02 mg/l	0.003	1330	10/12/94	CC
Nitrate as N	353.2	0.39 mg/l	0.004	1730	09/28/94	CC

* Higher detection level due to interferences.

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 155252
Sample Name: F-2
Sample Date: 09/27/94
Collected by: RICHARD E. GIRAUD
Time Sampled: NONE GIVEN
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3	310.1	601 mg/l	-	1400	10/03/94	HB
Alkalinity Carbonate as CO3	310.1	6 mg/l	-	1400	10/03/94	HB
Alkalinity Total as CaCO3	310.1	502 mg/l	0.43	1400	10/03/94	HB
Chloride as Cl	325.3	60 mg/l	0.37	1400	10/12/94	HB
Sulfate as SO4	375.2	690 mg/l	1.75	1130	09/30/94	CC
CATIONS						
Calcium as Ca	200.7	96 mg/l	0.10	1130	10/05/94	BH
Hardness as CaCO3	2340B	697 mg/l	-	1130	10/05/94	BH
Magnesium as Mg	200.7	111 mg/l	0.10	1130	10/05/94	BH
Potassium as K	258.1	6 mg/l	0.18	1300	10/07/94	AAH
Sodium as Na	200.7	256 mg/l	0.81	1030	10/14/94	BH
INORGANICS						
Electrical Conductivity	120.1	2260 umhos/cm	7.3	1400	10/05/94	HB
Oil & Grease	413.1	<1 mg/l	0.9	1000	10/11/94	CC
Settleable Solids	160.5	<0.1 ml/l	-	1556	09/28/94	TK
Total Dissolved Solids	160.1	1540 mg/l	6.3	0930	10/05/94	TK
Total Suspended Solids	160.2	8 mg/l	5.4	1000	10/03/94	TK
METALS						
Aluminum as Al (Dissolved)	200.7	0.2 mg/l	0.02	1100	10/03/94	BH
Arsenic as As (Dissolved)	206.3	<0.002 mg/l	0.002	1300	10/06/94	AAH
Boron as B (Dissolved)	200.7	0.2 mg/l	0.02	1510	10/07/94	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.0009	1100	10/10/94	BH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1100	10/03/94	BH
Iron as Fe (Dissolved)	200.7	<0.05 mg/l	0.006	1430	10/07/94	BH
Iron as Fe (Total)	200.7	0.54 mg/l	0.006	0950	10/11/94	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1400	10/11/94	AAH
Manganese as Mn (Dissolved)	200.7	<0.02 mg/l	0.001	1430	10/07/94	BH
Manganese as Mn (Total)	200.7	0.04 mg/l	0.001	0950	10/11/94	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05 mg/l	0.009	1430	10/07/94	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.002	1500	10/05/94	AAH
Zinc as Zn (Dissolved)	200.7	<0.02 mg/l	0.002	1430	10/07/94	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	<0.05 mg/l	0.015	1700	10/14/94	DD
Nitrite as N	354.2	<0.05 mg/l	0.005	1600	09/28/94	CC
Phosphorous Total	365.1	<0.02 mg/l	0.003	1330	10/12/94	CC
Nitrate as N	353.2	0.48 mg/l	0.004	1730	09/28/94	CC

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 155253
Sample Name: DRAGERRTON WELL
Sample Date: 09/27/94
Collected by: RICHARD E. GIRAUD
Time Sampled: NONE GIVEN
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3	310.1	463 mg/l	-	1400	10/03/94	HB
Alkalinity Carbonate as CO3	310.1	0 mg/l	-	1400	10/03/94	HB
Alkalinity Total as CaCO3	310.1	379 mg/l	0.43	1400	10/03/94	HB
Chloride as Cl	325.3	30 mg/l	0.37	1400	10/12/94	HB
Sulfate as SO4	375.2	412 mg/l	1.75	1130	09/30/94	CC
CATIONS						
Calcium as Ca	200.7	81 mg/l	0.10	1130	10/05/94	BH
Hardness as CaCO3	2340B	511 mg/l	-	1130	10/05/94	BH
Magnesium as Mg	200.7	75 mg/l	0.10	1130	10/05/94	BH
Potassium as K	258.1	4 mg/l	0.18	1300	10/07/94	AAH
Sodium as Na	200.7	144 mg/l	0.81	1030	10/14/94	BH
INORGANICS						
Electrical Conductivity	120.1	1520 umhos/c	7.3	1400	10/05/94	HB
Oil & Grease	413.1	<1 mg/l	0.9	1000	10/11/94	CC
Settleable Solids	160.5	<0.1 ml/l	-	1556	09/28/94	TK
Total Dissolved Solids	160.1	981 mg/l	6.3	0930	10/05/94	TK
Total Suspended Solids	160.2	<5 mg/l	5.4	1000	10/03/94	TK
METALS						
Aluminum as Al (Dissolved)	200.7	0.2 mg/l	0.02	1100	10/03/94	BH
Arsenic as As (Dissolved)	206.3	<0.002 mg/l	0.002	1300	10/06/94	AAH
Boron as B (Dissolved)	200.7	0.2 mg/l	0.02	1510	10/07/94	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.0009	1100	10/10/94	BH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1100	10/03/94	BH
Iron as Fe (Dissolved)	200.7	<0.05 mg/l	0.006	1430	10/07/94	BH
Iron as Fe (Total)	200.7	0.10 mg/l	0.006	0950	10/11/94	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1400	10/11/94	AAH
Manganese as Mn (Dissolved)	200.7	<0.02 mg/l	0.001	1430	10/07/94	BH
Manganese as Mn (Total)	200.7	0.03 mg/l	0.001	0950	10/11/94	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05 mg/l	0.009	1430	10/07/94	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.002	1500	10/05/94	AAH
Zinc as Zn (Dissolved)	200.7	<0.02 mg/l	0.002	1430	10/07/94	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	<0.05 mg/l	0.015	1700	10/14/94	DD
Nitrite as N	354.2	<0.05 mg/l	0.005	1600	09/28/94	CC
Phosphorous Total	365.1	<0.02 mg/l	0.003	1330	10/12/94	CC
Nitrate as N	353.2	0.80 mg/l	0.004	1730	09/28/94	CC

CHAIN OF C STODY RECORD

Huntingdon
Consulting Engineers Environmental Scientists

- [x] Chen-Northern, Inc., Division
- [ ] Thomas-Hartig & Associates, Inc., Division
- [ ] Schaefer Dixon Associates, Inc., Division
- [ ] Herzog Associates, Inc., Division

Sunnyside / DOE M
Project or Site Name

5-0137.3 - 91
Project Number

Richard F. Ciraud
Sampler Name (Printed)

Rich Ciraud
Contact or Report to

1127 W 23205, Suite B Sl. UT 84119
Contact Address or Location

Richard F. Ciraud
Sampler Signature

DATE COLLECTED	TIME COLLECTED	SAMPLE LOCATION OR DESCRIPTION	COMP OR GRAB	SAMPLE MATRIX	NO. OF CONTAINERS	ANALYSIS REQUIRED	NOTES	LAB NUMBER
9/27/94		Icc-1	grab	H2O	6	see attached sheet		155249
9/27/94		CRS	"	"	6			50
9/27/94		CRB	"	"	6			51
9/27/94		F-2	"	"	6			52
9/27/94		Disposition Well	"	"	6			53

Per 15205 D.C.

	Date	Time	
Relinquished by: Richard F. Ciraud	9-27-94	1540	Received by: Carrier / FedEx
Relinquished by: ~~X~~	9/28/94	0938	Received by: H Cleveland
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:

Remarks: please note
Nutrients
48 hr holding time

Green Cooler temp 1.2°C
Red Cooler temp 15°C

Huntingdon

(Formerly Chen-Northern, Inc.)
O South 25th Street
P O Box 30615
Billings, MT 59107
(406) 248-9161
FAX (406) 248-9282

TECHNICAL REPORT

REPORT TO: ATTN: RICH GIRAUD
HUNTINGDON ENGINEERING &
ENVIRONMENTAL, INC.
1127 WEST 2320 SOUTH, SUITE B
SALT LAKE CITY UT 84119

DATE: January 20, 1995
JOB NUMBER: 87-927
SHEET: 1 of 5
INVOICE NO.: 003084

REPORT OF: Water Analysis - Sunnyside DOGM 5-137.3-91

SAMPLE IDENTIFICATION:

On December 20, 1994, these water samples (laboratory numbers 158101 through 158105) were received in our laboratory for analysis. Tests were conducted in accordance with the U.S. Environmental Protection Agency Manual EPA 600/4-79-020 *"Methods for Chemical Analysis of Water and Wastes."*

The condition of the samples upon receipt at the laboratory is noted on the attached sample receipt checklist.

The test results are shown on the following pages.

A < sign indicates the value reported was the practical quantitation limit for this sample using the method described. Concentrations of analyte, if present, below this were not quantifiable.

Reviewed by David Conrill

Attachment: Sample Receipt Checklist

rmr

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 158102
Sample Name: F-2/121994
Sample Date: 12/19/94
Collected by: RICHARD E. GIRAUD
Time Sampled: NONE GIVEN
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS						
Alkalinity Bicarbonate as HCO3	310.1	492 mg/l	-	1300	01/11/95	DD
Alkalinity Carbonate as CO3	310.1	0 mg/l	-	1300	01/11/95	DD
Alkalinity Total as CaCO3	310.1	403 mg/l	0.4	1300	01/11/95	DD
Chloride as Cl	325.2	23 mg/l	0.7	1400	01/09/95	CC
Sulfate as SO4	375.2	290 mg/l	2	1500	12/30/94	DD
CATIONS						
Calcium as Ca	200.7	72 mg/l	0.1	1030	01/10/95	BH
Hardness as CaCO3	2340B	452 mg/l	-	1030	01/10/95	BH
Magnesium as Mg	200.7	66 mg/l	0.1	1030	01/10/95	BH
Potassium as K	258.1	3 mg/l	0.2	1430	12/29/94	AAH
Sodium as Na	200.7	141 mg/l	0.8	1030	01/10/95	BH
INORGANICS						
Electrical Conductivity	120.1	1300 umhos/cm	7	1500	12/29/94	HB
Oil & Grease	413.1	<1 mg/l	1	1400	01/04/95	DD
Settleable Solids	160.5	<0.1 ml/l	0.1	--	12/21/94	DD
Total Dissolved Solids	160.1	894 mg/l	6	1700	12/22/94	CC
Total Suspended Solids	160.2	3 mg/l	2	1530	12/22/94	CC
METALS						
Aluminum as Al (Dissolved)	200.7	<0.1 mg/l	0.02	1515	01/03/95	BH
Arsenic as As (Dissolved)	206.3	<0.002 mg/l	0.002	1600	01/04/95	AAH
Boron as B (Dissolved)	200.7	0.1 mg/l	0.02	1345	01/03/95	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.00009	1800	01/10/95	AAH
Copper as Cu (Dissolved)	200.7	<0.02 mg/l	0.004	1515	01/03/95	BH
Iron as Fe (Dissolved)	200.7	0.08 mg/l	0.006	1345	01/03/95	BH
Iron as Fe (Total)	200.7	0.10 mg/l	0.006	1420	01/10/95	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1400	01/06/95	AAH
Manganese as Mn (Dissolved)	200.7	<0.02 mg/l	0.001	1345	01/03/95	AAH
Manganese as Mn (Total)	200.7	<0.02 mg/l	0.001	1420	01/10/95	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05 mg/l	0.009	1600	01/03/95	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.001	1500	01/03/95	AAH
Zinc as Zn (Dissolved)	200.7	<0.02 mg/l	0.002	1345	01/03/95	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	<0.05 mg/l	0.02	1300	12/28/94	CC
Nitrite as N	353.2	<0.05 mg/l	0.005	1000	12/21/94	DD
Phosphorous Total	365.1	<0.02 mg/l	0.003	1630	01/10/95	CC
Nitrate as N	353.2	0.66 mg/l	0.004	1200	12/27/94	BH

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 158105
Sample Name: CRB/121994
Sample Date: 12/19/94
Collected by: RICHARD E. GIRAUD
Time Sampled: NONE GIVEN
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE	METHOD DETECTION LIMIT	TIME OF ANALYSIS	DATE OF ANALYSIS	ANALYST
ANIONS*						
Alkalinity Bicarbonate as HCO3	310.1	440 mg/l	-	1330	12/22/94	BH
Alkalinity Carbonate as CO3	310.1	0 mg/l	-	1330	12/22/94	BH
Alkalinity Total as CaCO3	310.1	361 mg/l	0.4	1330	12/22/94	BH
Chloride as Cl	325.3	197 mg/l	0.7	--	01/13/95	DD
Sulfate as SO4	375.2	2800 mg/l	2	1500	12/30/94	DD
CATIONS*						
Calcium as Ca	200.7	570 mg/l	0.1	1130	01/12/95	BH
Hardness as CaCO3	23408	2780 mg/l	-	1130	01/12/95	BH
Magnesium as Mg	200.7	330 mg/l	0.1	1030	01/10/95	BH
Potassium as K	258.1	31 mg/l	0.2	1430	12/29/94	AAH
Sodium as Na	200.7	507 mg/l	0.8	1030	01/10/95	BH
INORGANICS						
Electrical Conductivity	120.1	5190 umhos/cm	7	1500	12/29/94	HB
Oil & Grease	413.1	<1 mg/l	1	1400	01/04/95	DD
Settleable Solids	160.5	<0.1 ml/l	0.1	-	12/21/94	DD
Total Dissolved Solids	160.1	5070 mg/l	6	1700	12/22/94	CC
Total Suspended Solids	160.2	<1 mg/l	2	1530	12/22/94	CC
METALS						
Aluminum as Al (Dissolved)	200.7	0.3 mg/l	0.02	1515	01/03/95	BH
Arsenic as As (Dissolved)	206.3	<0.002 mg/l	0.002	1600	01/04/95	AAH
Boron as B (Dissolved)	200.7	0.9 mg/l	0.02	1345	01/03/95	BH
Cadmium as Cd (Dissolved)	213.2	<0.001 mg/l	0.00009	1800	01/10/95	AAH
Copper as Cu (Dissolved)	200.7	<0.06 mg/l	0.004	1515	01/03/95	BH
Iron as Fe (Dissolved)	200.7	<0.15 mg/l	0.006	1345	01/03/95	BH
Iron as Fe (Total)	200.7	0.18 mg/l	0.006	1420	01/10/95	BH
Lead as Pb (Dissolved)	239.2	<0.002 mg/l	0.001	1400	01/06/95	AAH
Manganese as Mn (Dissolved)	200.7	0.12 mg/l	0.001	1345	01/03/95	BH
Manganese as Mn (Total)	200.7	0.15 mg/l	0.001	1420	01/10/95	AAH
Molybdenum as Mo (Dissolved)	200.7	<0.05 mg/l	0.009	1600	01/03/95	BH
Selenium as Se (Dissolved)	270.3	<0.002 mg/l	0.001	1500	01/03/95	AAH
Zinc as Zn (Dissolved)	200.7	<0.02 mg/l	0.002	1345	01/03/95	BH
NUTRIENTS						
Ammonia Nitrogen as N	350.1	0.07 mg/l	0.02	1300	12/28/94	CC
Nitrite as N	353.2	<0.05 mg/l	0.005	1000	12/21/94	DD
Phosphorous Total	365.1	<0.02 mg/l	0.003	1630	01/10/95	CC
Nitrate as N	353.2	0.70 mg/l	0.004	1200	12/27/94	BH

* The cation-anion analysis does not meet our quality assurance requirements. However, the values reported herein were verified by duplicate analysis. This indicates there are other unmeasured cations or anions present in the sample.

Huntingdon

receipt.lst

SAMPLE RECEIPT CHECKLIST

Client Name: H-SLC

Project: Sunnyside DGM

Laboratory number(s): 15811-05

Checklist completed by: BH 12/26/94 (Initials / Date)

Date/Time Received: 12/26/94 (Date) 1355 (Time)

Received by: [illegible]

Carrier name: UPS

Logged in by: _____ (Initials / Date)

Sample Type: water

		YES	NO
1.	Shipping container in good condition?	X	
2.	Custody seals present on shipping container?	X	
3.	Condition: Intact X Broken		
4.	Chain of custody present?	X	
5.	Chain of custody signed when relinquished and received?	X	
6.	Chain of custody agrees with sample labels?		X
7.	Custody seals on sample bottles?		X
8.	Condition: Intact _____ Broken _____		
9.	Samples in proper container/bottle?	X	
10.	Samples intact?	X	
11.	Sufficient sample volume for indicated test?	X	
12.	VOA vials have zero headspace?	N/A	
13.	Trip Blank received?	N/A	
14.	Ice/Frozen Blue Ice present in shipping container? (circle one)	X	
15.	Container temperature 1. 5.5°C 2. _____ 3. _____		

		YES	NO
16.	All samples rec'd within holding time?	X	
	Preservation		
17.	pH check performed by: BH		
18.	Metals bottle(s) pH <2?	X	
19.	Nutrient bottle(s) pH <2?	X	
20.	Cyanide bottle(s) pH >12?	N/A	
21.	Sulfide bottle(s) pH >9?		
22.	Oil & grease bottle(s) pH <2?		
23.	TOC bottle(s) pH <2?	N/A	
24.	DRO/418.1 bottle(s) pH <2?		
25.	Phenolics bottle(s) pH <2?		
26.	Volatiles (VOA) pH <2? (VOA pH checked by analyst)		
27.	Client contacted?		
28.	Person contacted		
29.	Date contacted		
30.	Contacted by		
31.	Regarding?		

Any NO response must be detailed in the comments section below. If items are not applicable, they should be marked NA.

COMMENTS: #6 Metals sample for CRS/12794 was not labeled, there are 6 bottles to each set instead of 5, dissolved metals not marked as filtered, dissolved in 500ml bottles instead of 1000ml, total metals in 1000ml bottles, not 500ml.

Huntingdon
(Formerly Chen-Northern, Inc.)
600 South 25th Street
P O Box 30615
llings, MT 59107
406) 248-9161
FAX (406) 248-9282

TECHNICAL REPORT

REPORT TO: ATTN: RICH GIRAUD
HUNTINGDON ENGINEERING &
ENVIRONMENTAL, INC.
1127 WEST 2320 SOUTH, SUITE B
SALT LAKE CITY UT 84119

DATE: April 28, 1995
JOB NUMBER: 87-927
SHEET: 1 of 14
INVOICE NO.: 029206

REPORT OF: Water Analysis - Sunnyside DOGM 5-137.4-91

SAMPLE IDENTIFICATION:

On March 28, 1995, these water samples (laboratory numbers 161306 through 161312) were received in our laboratory for analysis. Tests were conducted in accordance with the U.S. Environmental Protection Agency Manual EPA 600/4-79-020 *"Methods for Chemical Analysis of Water and Wastes"*.

The condition of the samples upon receipt at the laboratory is noted on the attached sample receipt checklist. Chain of custody documentation is enclosed.

The test results are shown on the following pages.

A < sign indicates the value reported was the practical quantitation limit for this sample using the method described. Concentrations of analyte, if present, below this were not quantifiable.

Reviewed by

Attachments: Sample Receipt Checklist
Chain of Custody

rmr

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161306
Sample Name: ICE-1
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1305
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
ANIONS							
Alkalinity Bicarbonate as HCO3	310.1	524	mg/l	0.52	04/05/95	1300	HB
Alkalinity Carbonate as CO3	310.1	11	mg/l	0	04/05/95	1300	HB
Alkalinity Total as CaCO3	310.1	448	mg/l	0.43	04/05/95	1300	HB
Chloride as Cl	325.3	72	mg/l	0.37	04/17/95	1200	HB
Sulfate as SO4	375.2	830	mg/l	1.75	04/12/95	1130	DD
CATIONS							
Calcium as Ca	200.7	98	mg/l	0.10	04/04/95	1030	BH
Hardness as CaCO3	2340B	772	mg/l	0.7	04/04/95	1030	BH
Magnesium as Mg	200.7	128	mg/l	0.10	04/04/95	1030	BH
Potassium as K	258.1	6	mg/l	0.18	03/29/95	NG	BH
Sodium as Na	200.7	300	mg/l	0.45	04/04/95	1440	BH
INORGANICS							
Electrical Conductivity	120.1	2540	umhos/	7.3	04/13/95	1600	HB
Oil & Grease	413.1	8	mg/l	1.9	04/07/95	1000	AH
Settleable Solids	160.5	<0.1	ml/l	---	03/28/95	ND	DD
Total Dissolved Solids	160.1	1670	mg/l	6.3	03/30/95	1610	CC
Total Suspended Solids	160.2	<5	mg/l	5.4	03/29/95	1630	BH
METALS							
Aluminum as Al (Dissolved)	200.7	<0.1	mg/l	0.02	04/12/95	1400	BH
Arsenic as As (Dissolved)	206.3	<0.002	mg/l	0.002	04/04/95	1400	AAH
Boron as B (Dissolved)	200.7	0.2	mg/l	0.022	04/12/95	1400	BH
Cadmium as Cd (Dissolved)	213.2	<0.001	mg/l	00009	04/07/95	1600	AAH
Copper as Cu (Dissolved)	200.7	<0.02	mg/l	0.004	04/12/95	1400	BH
Iron as Fe (Dissolved)	200.7	<0.05	mg/l	0.006	04/12/95	1400	BH
Iron as Fe (Total)	200.7	0.29	mg/l	0.006	04/06/95	1400	BH
Lead as Pb (Dissolved)	239.2	<0.002	mg/l	00045	04/05/95	NG	AAH
Manganese as Mn (Dissolved)	200.7	<0.04 *	mg/l	0.0004	04/12/95	1400	BH
Manganese as Mn (Total)	200.7	<0.02	mg/l	0.0004	04/06/95	1400	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05	mg/l	0.009	04/12/95	1400	BH
Selenium as Se (Dissolved)	270.3	<0.002	mg/l	0.0014	04/03/95	1500	AAH
Zinc as Zn (Dissolved)	200.7	<0.02	mg/l	0.002	04/12/95	1400	BH
MISCELLANEOUS							
Cation/Anion Balance	---	0.6	%	---	--		--

* Higher detection limit due to interference in the sample.

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161306
Sample Name: ICE-1
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1305
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
NUTRIENTS							
Ammonia Nitrogen as N	350.1	0.09	mg/l	0.015	03/29/95	1200	CC
Nitrite as N	353.2	<0.05	mg/l	0.005	03/28/95	NG	DD
Phosphorous Total	365.1	0.029	mg/l	0.003	04/03/95	1200	BH
Nitrate as N	353.2	0.20	mg/l	0.004	03/29/95	1300	CC

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161307
Sample Name: CRS
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1405
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
ANIONS							
Alkalinity Bicarbonate as HCO3	310.1	605	mg/l	0.52	04/05/95	1300	HB
Alkalinity Carbonate as CO3	310.1	0	mg/l	0	04/05/95	1300	HB
Alkalinity Total as CaCO3	310.1	496	mg/l	0.43	04/05/95	1300	HB
Chloride as Cl	325.3	104	mg/l	0.37	04/17/95	1200	HB
Sulfate as SO4	375.2	3400	mg/l	1.75	04/12/95	1130	DD
CATIONS							
Calcium as Ca	200.7	560	mg/l	0.10	04/04/95	1030	BH
Hardness as CaCO3	2340B	2750	mg/l	0.7	04/04/95	1030	BH
Magnesium as Mg	200.7	328	mg/l	0.10	04/04/95	1030	BH
Potassium as K	258.1	37	mg/l	0.18	03/29/95	NG	BH
Sodium as Na	200.7	580	mg/l	0.81	04/04/95	1440	BH
INORGANICS							
Electrical Conductivity	120.1	5210	umhos/	7.3	04/13/95	1600	HB
Oil & Grease	413.1	<2	mg/l	1.9	04/07/95	1000	AH
Settleable Solids	160.5	<0.1	ml/l	---	03/28/95	NG	DD
Total Dissolved Solids	160.1	5090	mg/l	6.3	03/30/95	1610	CC
Total Suspended Solids	160.2	24	mg/l	5.4	03/29/95	1630	BH
METALS							
Aluminum as Al (Dissolved)	200.7	<0.1	mg/l	0.02	04/12/95	1400	BH
Arsenic as As (Dissolved)	206.3	<0.002	mg/l	0.002	04/04/95	1400	AAH
Boron as B (Dissolved)	200.7	0.7	mg/l	0.022	04/12/95	1400	BH
Cadmium as Cd (Dissolved)	213.2	<0.001	mg/l	00009	04/07/95	1600	AAH
Copper as Cu (Dissolved)	200.7	<0.02	mg/l	0.004	04/12/95	1400	BH
Iron as Fe (Dissolved)	200.7	1.23	mg/l	0.006	04/12/95	1400	BH
Iron as Fe (Total)	200.7	1.5	mg/l	0.006	04/06/95	1400	BH
Lead as Pb (Dissolved)	239.2	<0.002	mg/l	0.0013	04/05/95	NG	AAH
Manganese as Mn (Dissolved)	200.7	0.43	mg/l	0.001	04/12/95	1400	BH
Manganese as Mn (Total)	200.7	0.78	mg/l	0.001	04/06/95	1400	BH
Molybdenum as Mo (Dissolved)	200.7	0.06	mg/l	0.009	04/12/95	1400	BH
Selenium as Se (Dissolved)	270.3	<0.002	mg/l	0.0014	04/03/95	1500	AAH
Zinc as Zn (Dissolved)	200.7	<0.02	mg/l	0.002	04/12/95	1400	BH
MISCELLANEOUS							
Cation/Anion Balance	---	1.5	%	---		--	--

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161307
Sample Name: CRS
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1405
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
NUTRIENTS							
Ammonia Nitrogen as N	350.1	1.78	mg/l	0.015	03/29/95	1330	CC
Nitrite as N	353.2	<0.05	mg/l	0.005	03/28/95	NG	DD
Phosphorous Total	365.1	0.170	mg/l	0.003	04/03/95	1200	BH
Nitrate as N	353.2	<0.05	mg/l	0.004	03/29/95	1300	CC

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161308
Sample Name: CRB
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1430
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
ANIONS							
Alkalinity Bicarbonate as HCO3	310.1	398	mg/l	0.52	04/05/95	1300	HB
Alkalinity Carbonate as CO3	310.1	0	mg/l	0	04/05/95	1300	HB
Alkalinity Total as CaCO3	310.1	326	mg/l	0.43	04/05/95	1300	HB
Chloride as Cl	325.3	217	mg/l	0.37	04/17/95	1200	HB
Sulfate as SO4	375.2	3000	mg/l	1.75	04/12/95	1130	DD
CATIONS							
Calcium as Ca	200.7	480	mg/l	0.10	04/04/95	1030	BH
Hardness as CaCO3	2340B	2401	mg/l	0.7	04/04/95	1030	BH
Magnesium as Mg	200.7	292	mg/l	0.10	04/04/95	1030	BH
Potassium as K	258.1	27	mg/l	0.18	03/29/95	NG	BH
Sodium as Na	200.7	564	mg/l	0.45	04/04/95	1030	BH
INORGANICS							
Electrical Conductivity	120.1	4950	umhos/	7.3	04/13/95	1600	HB
Oil & Grease	413.1	<2	mg/l	1.9	04/07/95	1000	AH
Settleable Solids	160.5	<0.1	ml/l	---	03/28/95	NG	DD
Total Dissolved Solids	160.1	4880	mg/l	6.3	03/30/95	1610	CC
Total Suspended Solids	160.2	<5	mg/l	5.4	03/29/95	1630	BH
METALS							
Aluminum as Al (Dissolved)	200.7	<0.1	mg/l	0.02	04/12/95	1400	BH
Arsenic as As (Dissolved)	206.3	<0.002	mg/l	0.002	04/04/95	1400	AAH
Boron as B (Dissolved)	200.7	0.5	mg/l	0.022	04/12/95	1400	BH
Cadmium as Cd (Dissolved)	213.2	<0.001	mg/l	00009	04/07/95	1600	AAH
Copper as Cu (Dissolved)	200.7	<0.02	mg/l	0.004	04/12/95	1400	BH
Iron as Fe (Dissolved)	200.7	<0.25*	mg/l	0.006	04/12/95	1400	BH
Iron as Fe (Total)	200.7	<0.05	mg/l	0.006	04/06/95	1400	BH
Lead as Pb (Dissolved)	239.2	<0.002	mg/l	0.0003	04/05/95	NG	AAH
Manganese as Mn (Dissolved)	200.7	<0.10*	mg/l	0.001	04/12/95	1400	BH
Manganese as Mn (Total)	200.7	<0.02	mg/l	0.001	04/06/95	1400	BH
Molybdenum as Mo (Dissolved)	200.7	0.07	mg/l	0.009	04/12/95	1400	BH
Selenium as Se (Dissolved)	270.3	<0.002	mg/l	0.0014	04/03/95	1500	AAH
Zinc as Zn (Dissolved)	200.7	<0.02	mg/l	0.002	04/12/95	1400	BH
MISCELLANEOUS							
Cation/Anion Balance	---	1.3	%	---		--	--

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161308
Sample Name: CRB
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1430
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
NUTRIENTS							
Ammonia Nitrogen as N	350.1	<0.05	mg/l	0.015	03/29/95	1200	CC
Nitrite as N	353.2	<0.05	mg/l	0.005	03/28/95	NG	DD
Phosphorous Total	365.1	0.050	mg/l	0.003	04/03/95	1200	BH
Nitrate as N	353.2	0.61	mg/l	0.004	03/29/95	1300	CC

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161309
Sample Name: F-2
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1500
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
ANIONS							
Alkalinity Bicarbonate as HCO3	310.1	610	mg/l	0.52	04/05/95	1300	HB
Alkalinity Carbonate as CO3	310.1	0	mg/l	0	04/05/95	1300	HB
Alkalinity Total as CaCO3	310.1	500	mg/l	0.43	04/05/95	1300	HB
Chloride as Cl	325.3	72	mg/l	0.37	04/17/95	1200	HB
Sulfate as SO4	375.2	760	mg/l	1.75	04/12/95	1130	DD
CATIONS							
Calcium as Ca	200.7	108	mg/l	0.10	04/04/95	1030	BH
Hardness as CaCO3	2340B	751	mg/l	0.7	04/04/95	1030	BH
Magnesium as Mg	200.7	117	mg/l	0.10	04/04/95	1030	BH
Potassium as K	258.1	5	mg/l	0.18	03/29/95	NG	BH
Sodium as Na	200.7	306	mg/l	0.45	04/04/95	1030	BH
INORGANICS							
Electrical Conductivity	120.1	2360	umhos/	7.3	04/13/95	1600	HB
Oil & Grease	413.1	2	mg/l	1.9	04/07/95	1000	AH
Settleable Solids	160.5	<0.1	ml/l	---	03/28/95	NG	DD
Total Dissolved Solids	160.1	1600	mg/l	6.3	03/30/95	1610	CC
Total Suspended Solids	160.2	<5	mg/l	5.4	03/29/95	1630	BH
METALS							
Aluminum as Al (Dissolved)	200.7	<0.1	mg/l	0.02	04/12/95	1400	BH
Arsenic as As (Dissolved)	206.3	<0.002	mg/l	0.002	04/04/95	1400	AAH
Boron as B (Dissolved)	200.7	0.2	mg/l	0.022	04/12/95	1400	BH
Cadmium as Cd (Dissolved)	213.2	<0.001	mg/l	00009	04/07/95	1600	AAH
Copper as Cu (Dissolved)	200.7	<0.02	mg/l	0.004	04/12/95	1400	BH
Iron as Fe (Dissolved)	200.7	<0.05	mg/l	0.006	04/12/95	1400	BH
Iron as Fe (Total)	200.7	<0.05	mg/l	0.006	04/06/95	1400	BH
Lead as Pb (Dissolved)	239.2	<0.002	mg/l	0.0013	04/05/95	NG	AAH
Manganese as Mn (Dissolved)	200.7	<0.02	mg/l	0.001	04/12/95	1400	BH
Manganese as Mn (Total)	200.7	<0.02	mg/l	0.001	04/06/95	1400	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05	mg/l	0.009	04/12/95	1400	BH
Selenium as Se (Dissolved)	270.3	<0.002	mg/l	0.0014	04/03/95	1500	AAH
Zinc as Zn (Dissolved)	200.7	<0.02	mg/l	0.002	04/12/95	1400	BH
MISCELLANEOUS							
Cation/Anion Balance	---	1.1	%	---		---	--

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161309
Sample Name: F-2
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1500
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
NUTRIENTS							
Ammonia Nitrogen as N	350.1	<0.05	mg/l	0.015	03/29/95	1200	CC
Nitrite as N	353.2	<0.05	mg/l	0.005	03/28/95	NG	DD
Phosphorous Total	365.1	<0.02	mg/l	0.003	04/03/95	1200	BH
Nitrate as N	353.2	0.51	mg/l	0.004	03/29/95	1300	CC

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161310
Sample Name: WELL
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1525
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
ANIONS							
Alkalinity Bicarbonate as HCO3	310.1	362	mg/l	0.52	04/05/95	1300	HB
Alkalinity Carbonate as CO3	310.1	0	mg/l	0	04/05/95	1300	HB
Alkalinity Total as CaCO3	310.1	297	mg/l	0.43	04/05/95	1300	HB
Chloride as Cl	325.3	4	mg/l	0.37	04/17/95	1200	HB
Sulfate as SO4	375.2	150	mg/l	1.75	04/12/95	1130	DD
CATIONS							
Calcium as Ca	200.7	50	mg/l	0.10	04/04/95	1030	BH
Hardness as CaCO3	2340B	318	mg/l	0.7	04/04/95	1030	BH
Magnesium as Mg	200.7	47	mg/l	0.10	04/04/95	1030	BH
Potassium as K	258.1	2	mg/l	0.18	03/29/95	NG	BH
Sodium as Na	200.7	70	mg/l	0.45	04/04/95	1030	BH
INORGANICS							
Electrical Conductivity	120.1	861	umhos/	7.3	04/13/95	1300	HB
Oil & Grease	413.1	**					
Settleable Solids	160.5	<0.01	ml/l	---	03/28/95	NG	DD
Total Dissolved Solids	160.1	512	mg/l	6.3	03/30/95	1610	CC
Total Suspended Solids	160.2	<5	mg/l	5.4	03/29/95	1630	BH
METALS							
Aluminum as Al (Dissolved)	200.7	<0.1	mg/l	0.02	04/12/95	1400	BH
Arsenic as As (Dissolved)	206.3	<0.002	mg/l	0.002	04/04/95	1400	AAH
Boron as B (Dissolved)	200.7	<0.1	mg/l	0.022	04/12/95	1400	BH
Cadmium as Cd (Dissolved)	200.7	<0.001	mg/l	00009	04/07/95	1600	AAH
Copper as Cu (Dissolved)	200.7	<0.02	mg/l	0.004	04/12/95	1400	BH
Iron as Fe (Dissolved)	200.7	<0.05	mg/l	0.006	04/12/95	1400	BH
Iron as Fe (Total)	200.7	<0.05	mg/l	0.006	04/06/95	1400	BH
Lead as Pb (Dissolved)	239.2	<0.002	mg/l	0.006	04/05/95	1400	AAH
Manganese as Mn (Dissolved)	200.7	<0.02	mg/l	0.001	04/12/95	1400	BH
Manganese as Mn (Total)	200.7	<0.02	mg/l	0.001	04/06/95	1400	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05	mg/l	0.009	04/12/95	140	BH
Selenium as Se (Dissolved)	270.3	<0.002	mg/l	0.0014	04/03/95	1500	AAH
Zinc as Zn (Dissolved)	200.7	<0.02	mg/l	0.002	04/12/95	1400	BH
MISCELLANEOUS							
Cation/Anion Balance	---	1.5	%	---		---	--

** Sample container was broken in shipment.

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161310
Sample Name: WELL
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1525
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
NUTRIENTS							
Ammonia Nitrogen as N	350.1	<0.05	mg/l	0.015	03/29/95	1200	CC
Nitrite as N	353.2	<0.05	mg/l	0.005	03/28/95	NG	DD
Phosphorous Total	365.1	0.028	mg/l	0.003	04/03/95	1200	BH
Nitrate as N	353.2	0.54	mg/l	0.004	03/29/95	1300	CC

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161311
Sample Name: DUPLICATE 161306 ICE-1
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1305
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
ANIONS							
Alkalinity Bicarbonate as HCO3	310.1	529	mg/l	0.52	04/05/95	1300	HB
Alkalinity Carbonate as CO3	310.1	11	mg/l	0	04/05/95	1300	HB
Alkalinity Total as CaCO3	310.1	453	mg/l	0.43	04/05/95	1300	HB
Chloride as Cl	325.3	74	mg/l	0.37	04/17/95	1200	HB
Sulfate as SO4	375.2	820	mg/l	1.75	04/12/95	1130	DD
CATIONS							
Calcium as Ca	200.7	98	mg/l	0.10	04/04/95	1030	BH
Hardness as CaCO3	2340B	764	mg/l	0.7	04/04/95	1030	BH
Magnesium as Mg	200.7	126	mg/l	0.10	04/04/95	1030	BH
Potassium as K	258.1	6	mg/l	0.18	03/29/95	NG	BH
Sodium as Na	200.7	300	mg/l	0.45	04/04/95	1030	BH
INORGANICS							
Electrical Conductivity	120.1	2590	umhos/	7.3	04/13/95	1600	HB
Total Suspended Solids	160.2	4	mg/l	5.4	03/29/95	1630	bh
METALS							
Aluminum as Al (Dissolved)	200.7	<0.1	mg/l	0.02	04/12/95	1400	BH
Arsenic as As (Dissolved)	206.3	<0.002	mg/l	0.002	04/04/95	1400	AAH
Boron as B (Dissolved)	200.7	0.2	mg/l	0.022	04/12/95	1400	BH
Cadmium as Cd (Dissolved)	213.2	<0.001	mg/l	00009	04/07/95	1600	AAH
Copper as Cu (Dissolved)	200.7	<0.02	mg/l	0.004	04/12/95	1400	BH
Iron as Fe (Dissolved)	200.7	<0.05	mg/l	0.006	04/12/95	1400	BH
Iron as Fe (Total)	200.7	0.30	mg/l	0.006	04/06/95	1400	BH
Lead as Pb (Dissolved)	239.2	<0.002	mg/l	0.0013	04/05/95	1600	AAH
Manganese as Mn (Dissolved)	200.7	<0.04*	mg/l	0.001	04/12/95	1400	BH
Manganese as Mn (Total)	200.7	<0.02	mg/l	0.001	04/06/95	1400	BH
Molybdenum as Mo (Dissolved)	200.7	<0.05	mg/l	0.009	04/12/95	1400	BH
Selenium as Se (Dissolved)	270.3	<0.002	mg/l	0.0014	04/03/95	1500	AAH
Zinc as Zn (Dissolved)	200.7	<0.02	mg/l	0.002	04/12/95	1400	BH
MISCELLANEOUS							
Cation/Anion Balance	---	0.4	%	---		---	--
NUTRIENTS							
Ammonia Nitrogen as N	350.1	<0.05	mg/l	0.015	03/29/95	1200	CC
Nitrite as N	353.2	<0.05	mg/l	0.005	03/28/95	NG	DD

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161311
Sample Name: DUPLICATE 161306 ICE-1
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1305
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
Phosphorous Total	365.1	0.026	mg/l	0.003	04/03/95	1200	BH
Nitrate as N	353.2	0.20	mg/l	0.004	03/29/95	1300	CC

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161312
Sample Name: SPIKE 161310 WELL
Sample Date: 03/27/95
Collected by: RON GOSSARD
Time Sampled: 1525
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
ANIONS							
Alkalinity Total as CaCO3	310.1	98	%	0.43	04/05/95	1300	HB
Chloride as Cl	325.3	110	%	0.37	04/17/95	1200	HB
Sulfate as SO4	375.2	100	%	1.75	04/12/95	1130	DD
CATIONS							
Calcium as Ca	200.7	96	%	0.10	04/04/95	1030	BH
Magnesium as Mg	200.7	96	%	0.10	04/04/95	1030	BH
Potassium as K	258.1	110	%	0.18	03/29/95	NG	BH
Sodium as Na	200.7	96	%	0.45	04/04/95	1030	BH
METALS							
Aluminum as Al (Dissolved)	200.7	104	%	0.02	04/12/95	1400	BH
Arsenic as As (Dissolved)	206.3	100	%	0.002	04/04/95	1400	AAH
Boron as B (Dissolved)	200.7	102	%	0.022	04/12/95	1400	BH
Cadmium as Cd (Dissolved)	213.2	95	%	00009	04/07/95	1600	AAH
Copper as Cu (Dissolved)	200.7	101	%	0.004	04/12/95	1400	BH
Iron as Fe (Dissolved)	200.7	110	%	0.006	04/12/95	1400	BH
Iron as Fe (Total)	200.7	92	%	0.006	04/06/95	1400	BH
Lead as Pb (Dissolved)	239.2	100	%	0.0013	04/05/95	1600	AAH
Manganese as Mn (Dissolved)	200.7	101	%	0.001	04/12/95	1400	BH
Manganese as Mn (Total)	200.7	90	%	0.001	04/06/95	1400	BH
Molybdenum as Mo (Dissolved)	200.7	106	%	0.009	04/12/95	1400	BH
Selenium as Se (Dissolved)	270.3	95	%	0.0014	04/03/95	1500	AAH
Zinc as Zn (Dissolved)	200.7	112	%	0.002	04/12/95	1400	BH
NUTRIENTS							
Ammonia Nitrogen as N	350.1	93	%	0.015	03/29/95	1200	CC
Nitrite as N	353.2	104	%	0.005	03/28/95	NG	DD
Phosphorous Total	365.4	105	%	0.003	04/03/95	1200	BH
Nitrate as N	353.2	100	%	0.004	03/29/95	1300	CC

Huntingdon
(Formerly Chen-Northern, Inc.)
600 South 25th Street
P O Box 30615
Billings, MT 59107
(406) 248-9161
FAX (406) 248-9282

TECHNICAL REPORT

REPORT TO: ATTN: RICH GIRAUD
HUNTINGDON ENGINEERING &
ENVIRONMENTAL, INC.
1127 WEST 2320 SOUTH, SUITE B
SALT LAKE CITY UT 84119

DATE: April 28, 1995
JOB NUMBER: 87-927
SHEET: 1 of 2
INVOICE NO.: 029342

REPORT OF: Water Analysis - Sunnyside Cogeneration Facility 15-137.4-91

SAMPLE IDENTIFICATION:

On April 7, 1995, this water sample (laboratory number 161717) was received in our laboratory for analysis. Tests were conducted in accordance with the U.S. Environmental Protection Agency Manual EPA 600/4-79-020 *"Methods for Chemical Analysis of Water and Wastes."*

The condition of the sample upon receipt at the laboratory is noted on the attached sample receipt checklist. Chain of custody documentation is enclosed.

The test results are shown on the following page.

A < sign indicates the value reported was the practical quantitation limit for this sample using the method described. Concentrations of analyte, if present, below this were not quantifiable.

Reviewed by _____

Attachments: Sample Receipt Checklist
Chain of Custody

rmr

Client Name: HUNTINGDON - SALT LAKE CITY, UT
Project No.: 87-927
Laboratory No.: 161717
Sample Name: DAGERTON WELL 040595
Sample Date: 04/05/95
Collected by: RON GOSSARD
Time Sampled: 1445
Sample Type: WATER

PARAMETER	METHOD NUMBER	MEASURED VALUE		METHOD DETECTION LIMIT	DATE OF ANALYSIS	TIME OF ANALYSIS	ANALYST
INORGANICS							
Oil & Grease	413.1	<1	mg/l	1.9	04/18/95	NG	CJ

Sunnyside Cogeneration Facility
Project or Site Name

5-137.4-91
Project Number

Ron Gossard
Sampler Name (Printed)

CHAIN OF C' TODY RECORD

Huntingdon
Consulting Engineers Environmental Scientists

- [x] Chen-Northern, Inc., Division
- [ ] Thomas-Hartig & Associates, Inc., Division
- [ ] Schaefer Dixon Associates, Inc., Division
- [ ] Herzog Associates, Inc., Division

Rich Girard
Contact or Report to

1127 West 2320 South Ste B SLC, 84119
Contact Address or Location

Ron Gossard
Sampler Signature

DATE COLLECTED	TIME COLLECTED	SAMPLE LOCATION OR DESCRIPTION	COMP OR GRAB	SAMPLE MATRIX	NO. OF CONTAINERS	ANALYSIS REQUIRED (oil & grease 413.1)	NOTES	LAB NUMBER
~~4-7-95~~ 4-5-95	1445	Dagerton Well 040595	GRAB	H_2O	1	✓		
1617	17							

	Date	Time	Received by:	Remarks:
Relinquished by: Ron Gossard	4-6-95	1400	Airborne / Carrier	Huntingdon Lab - Billings, MT
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date	Time	Received by: Debra Kuehl HHT6 - BIG Shipping Dept 4-7-95 11:20	

Huntingdon

receipt.lst

SAMPLE RECEIPT CHECKLIST

Client Name: HTG-SLC

Project: _____

Laboratory number(s): _____

Checklist completed by: JK 4-7-95 (Initials / Date)

Date/Time Received: 4-7-95 11:30 (Date / Time)

Received by: Deena Kuehl

Carrier name: _____

Logged in by: Deena Kuehl 4/7 (Initials / Date)

Sample Type: _____

		YES	NO
1.	Shipping container in good condition?	✓	
2.	Custody seals present on shipping container?		✓
3.	Condition: Intact _____ Broken _____	✓	
4.	Chain of custody present?		
5.	Chain of custody signed when relinquished and received?	✓	
6.	Chain of custody agrees with sample labels?	✓	
7.	Custody seals on sample bottles?		✓
8.	Condition: Intact _____ Broken _____		
9.	Samples in proper container/bottle?		
10.	Samples intact?	✓	
11.	Sufficient sample volume for indicated test?		
12.	VOA vials have zero headspace?		
13.	Trip Blank received?		✓
14.	Ice/Frozen Blue Ice present in shipping container? (circle one)	✓	
15.	Container temperature 1. 4.6 2. _____ 3. _____		

		YES	NO
16.	All samples rec'd within holding time?		
	Preservation		
17.	pH check performed by: JK		
18.	Metals bottle(s) pH <2?	N/A	
19.	Nutrient bottle(s) pH <2?		
20.	Cyanide bottle(s) pH >12?		
21.	Sulfide bottle(s) pH >9?	N/A	
22.	Oil & grease bottle(s) pH <2?		
23.	TOC bottle(s) pH <2?	N/A	
24.	DRO/418.1 bottle(s) pH <2?		
25.	Phenolics bottle(s) pH <2?		
26.	Volatiles (VOA) pH <2? (VOA pH checked by analyst)		
27.	Client contacted?		
28.	Person contacted	_____	
29.	Date contacted	_____	
30.	Contacted by	_____	
31.	Regarding?	_____	

Any NO response must be detailed in the comments section below. If items are not applicable, they should be marked NA.

COMMENTS: _____

ATTACHMENT B

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah
Groundwater Discharge Permit Number UGW070002
Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: ICE-1 DOGM

Runoff Basin / Spring / Other: STREAM

Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	gpm Flow ~~(cfs)~~	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (~~F~~C)	pH	SC (umhos)	DO ~~Meter~~ ~~No.~~	Collection Point	Sample Taken (yes/no)
~~9/30/93~~	1335	CM CW	Sunny/Hot,	yes		185	~~VE~~ CC		29	8.08	2200	7.4	Marked	yes
7/27	1517	CM	Sunny Hot	yes		200	~~VE~~ CC		23	8.17	2300	6.2	"	NO
~~8/26/93~~	1103	CM	—	yes		120	CC		16	7.18	2200	7.2	"	NO
9/2/93	1700	CM CW	Sltd	yes		150	CC	-	20	8.23	2150	5.4	"	~~NO~~ yes
10/27	0830	MH	Cold	yes		150	VE		3.3	8.50	1200	6.0	"	NO
11/16	1310	MH	Cold	yes		150	VE		5.0	8.48	1800	5.6	"	~~NO~~
12/9	1555	CM	Cold	yes	clear	300	VE		4.8	8.49	2471	10.3	"	NO
1/13/94	1438	CM	Cold Clear	yes	Clear ICE-2 duplicate	~200	VE		5.1	8.29	2220	6.4	"	yes
2/28	1336	CM	Cool, P.C.	yes	light brown/silty	150	VE		8.9	8.16	1450	7.3	"	NO
3/31/94	12:39	CW/TMM	Warm, Sunny	yes	"	90	DF		12.9	7.90	1800	6.0	"	NO
4/19/94	1315	CW/CM	" "	yes	"	100	DF		17.2	8.23	2860	6.4	"	~~yes~~
5/31/94	1055	RL	cool, rain	yes	clear	300	CC		13.1	8.29	2257	9.9	"	NO
6/23	0928	CM	Sunny Hot	yes	clear	127	DF		21.9	8.74	2120	6.5	"	yes
7/21/94	0935	CM	Sunny Hot	yes	clear	90	DF		21.2	8.34	2150	7.1	"	NO
8/22/94	1450	CM	Sunny Hot	yes	clear	50	DF		25.7	8.71	2170	6.3	"	NO
9/29/94	1226	RB6	sunny, cool	yes	clear	4.0	~~DF~~ EG CC		18.2	8.50	2340.9	15.4	"	yes
10/19/94	1302	RB6/6M	cloudy cool	yes		120	CC		9.9	8.59	2491.3	8.8	"	yes
11/21/94	1217	RB6/REG	overcast, cool	yes		20	CC		1.1	8.84	2165	15.5	"	NO

* Basin water level measurements are taken from permanent reference point at basin location.
Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah

Groundwater Discharge Permit Number UGW070002

Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: F-2 (Wh. Spa) DOGM

Runoff Basin / Spring / Other:

Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	gpm Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (F)C	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
4/23/93	1515	GmCW	Sunny/Hot	yes	Clear water	100	CC		25	8.4	2300	7.8	Marked Point	yes
7/27	1456	Gm	Sunny/Hot	yes	"	~90	V.E		23	8.02	1900	5.9	"	~~yes~~
8/24/93	1058	Gm	Overcast	yes	"	100	CC		15	7.18	2150	6.2	"	NO
9/2/93	1757	GmCW	SW	yes	"	90	CC		17	7.54	2100	6.4	"	yes
10/27	0730	MH	W-dry	yes	"	100	CC		1.5	8.3	1200	7.0	"	NO
11/16	1310	MH	Cold	yes	"	100	CC		5.3	8.49	1300	6.20	"	NO
12/9	1530	Gm	Cold	yes	Grey from TSS(004)	150	CC		6.0	7.82	1800	12.7	"	NO
1/13/94	1535	Gm	Cold Clear	yes	Clear	~90	CC		5.6	8.51	1824	6.2	"	yes
2/28	1320	Gm	RC Cool	yes	Clear Water	35	CC		7.7	7.62	2180	6.9	"	NO
3/31/94	12:54	GW/TMM	Warm, Sunny	YES		25.5	CC		13.6	8.01	1500	6.4	"	NO
4/19	1525	OW/GM	" "	yes	Clear	36	CC		15.5	8.40	1800	8.6	"	yes
5/31/94	1247	RL	cool, rain	yes	clear	85	CC		12.5	8.16	1650	9.9	"	NO
6/23/94	1030	Gm	Sunny Hot	yes	clear	60	CC		18.7	8.49	2130	7.0	"	yes
7/21/94	0900	Gm	Sunny Hot	yes	clear	43	CC		18.9	7.98	3401	7.9	"	NO
8/22/94	1213	GM	Sunny Hot	yes	clear low flow	23	CC		22.4	7.85	3120	8.5	"	NO
9/29/94	1428	RBG	sunny cool	yes	clear	7.0	CC		19.5	8.26	2218.2	14.9	"	yes
10/19/94	1325	RBG/GM	cloudy cool	yes	clear	30.0	CC		10.5	8.35	2340.8	8.6	"	yes
11/21/94	1129	RBG/REG	overcast, cool	yes	clear	24.0	CC		3.4	8.63	2200	13.9	"	no

* Basin water level measurements are taken from permanent reference point at basin location.

Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah

Groundwater Discharge Permit Number UGW070002

Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: CRS (source) DO GM

Runoff Basin / Spring / Other:

Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
6/30/93	1335	GM CW	Sunny Hot	yes	Much Rust, Warm.	~30	Vis		32	6.77	4600	6.2	Flagged Point	yes
7/27	1620	CW	Sunny/Hot	yes	" "	~30	Vis		28	7.25	3200	2.4	"	NO
8/26/93	1158	GM	overcast	yes	" "	~40	VIS		25	6.81	2800	3.4	"	NO
9/23/93	1555	CW GM	SW	yes	" "	~40	Vis		28	7.12	4600	1.9	"	Yes
10/26	1320	MH	windy	yes	" "	40	Vis		23	6.98	4700	3.5	"	NO
11/16	1405	MH	Cold	yes	" "	50	Vis		23.2	6.86	4850	2.1	"	NO
12/9	1612	GM	Cold	yes	Warmer Less Flow	~30	Vis		23.2	6.93	4306	1.9	"	NO
1/14/94	1011	GM	Clear Cold	yes	" "	~100	V.S		21.2	7.08	4748	2.4	"	yes
2/28	1356	GM	PC, Cool	yes	" "	100	V.S		36.5	6.74	4470	0.9	"	NO
3/31/94	11:57	CW/GM	Warm, Sunny	Yes	" "	?	—		23.7	6.51	5400	1.4	"	NO
4/19	1356	CW/GM	" "	yes	Weir in place	10	W		26.9	6.83	4550	3.2	Weir	yes
5/31/94	1147	RL	cool, rain	yes	rust, warm, weir in place	8.5	W		23.6	6.64	4650	1.9	weir	NO
6/23/94	1049	GM	Sunny/Hot	yes	" "	8.5	W		37.2	6.88	5140	1.5	"	yes
7/21/94	1004	GM	Sunny/Hot	yes	" "	8.5	W		25.9	6.96	5480	1.3	"	NO
8/22/94	1545	GM	Sunny/Hot	yes	Clear, low flow Mod Veg.	7.1	W		27.5	7.01	5130	1.2	"	NO
9/29/94	1318	RBG	Sunny Cool	yes	Clean	8.5	W		26.2	6.58	5450	1.2	"	yes
10/19/94	1344	RBG/GM	Cloudy, cool	yes	lots of vegetation	8.5	W		21.1	6.86	5565.4	2.3	"	yes
11/21/94	1145	RBG/REG	overcast, cool	yes	vegetation	4.7	weir		18.9	7.11	5088	5.3		no

* Basin water level measurements are taken from permanent reference point at basin location.

Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah
Groundwater Discharge Permit Number UGW070002
Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: CRB (Boundary) DOGM

Runoff Basin / ~~Spring~~ / Other: Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (F)C	pH	SC (umhos)	DO Meter ~~No.~~	Collection Point	Sample Taken (yes/no)
6/30/93	1355	GM CW	Sunny Hot	yes	Much Leaf Litter on rocks	~30	Vis		26	7.60	4200	8.1	Stacked Point	yes
7/27	1620	GM	Sunny Hot	yes	"	~30	Vis		21	7.87	4600	5.0	"	NO
8/26/93	1159	GM	Overcast	yes	" "	~60	VIS.		18.5	6.50	2450	5.4	"	No
9/2	1643	GM CW	SW	~	~	~40	Vis		20	7.42	4150	4.9	"	NO
10/26	1400	MH	Windy	~	...	40	vis		8.3	7.58	3400	6.0	~	NO
11/16	1430	MH	Cold	yes	~ ~	40?	Vis		7.9	7.10	3300	5.5	"	NO
12/9	1627	GM	Cold	yes	Clear water	40?	Vis		5.9	7.94	3900	8.4	"	NO
1/14/94	1103	GM	Clear Cold	yes	Clear	200+	Vis		5.0	8.17	3100	6.0	"	yes
2/28	1407	GM	RC, Cool	yes	Less flow	120	Vis		15.6	7.91	4370	6.8	"	NO
3/31/94	12:27	CW/TMM	WARM, SUNNY	Yes		—	—		14.6	7.61	3500	6.5	"	NO
4/19	1430	CW/GM	" "	yes	Weir in place	38	W		19.3	7.96	4890	7.4	Weir	yes
5/31/94	1227	RL	cool, rain	yes	clear, flow is spread out	~~240~~	~~VE~~ W		14.1	7.73	4549	9.0	"	NO
6/20/94	1130	GM	Sunny Hot	yes	clear	40	W		20.9	7.99	4950	7.2	"	yes.
7/26/94	1009	GM	Sunny Hot	yes	clear	40	W		20.4	7.82	5200	6.8	"	NO
8/22/94	1556	GM	Sunny Hot	yes	clear	36	W		24.2	7.50	5130	7.3	"	NO
9/27/94	1347	RB6	Sunny cool	yes		40	W		21.8	7.86	5179.7	7.8	"	yes
10/19/94	1405	RB6/GM	cloudy cool	yes		48	W		13.0	8.06	5320	7.8	"	yes
11/21/94	1157	RB6/RE6	overcast, cool	yes		40.0	Weir		6.1	8.44	5093	13.9	"	no

* Basin water level measurements are taken from permanent reference point at basin location.
Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah
Groundwater Discharge Permit Number UGW070002
Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: WELL (E. Carbon Municipal well) DOGM

Runoff Basin / Spring / Other: Well

Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO ~~Meter~~ No.	Collection Point	Sample Taken (yes/no)
6/30/93	1130	GM CW	Sunny/Hot	~~yes~~ N.	Clear water	50 gpm	CC		16	7.8	1800	7.2	Hose	yes
7/27	1700	GM	Sunny/Hot	yes	" "	50 gpm	V.E.		17	8.18	3100	5.8	Hose	NO
8/26/93	1036	GM	Overcast	yes	" "	50 gpm	CC		12	6.77	920	4.9	"	NO
9/1/93	1486	GM CW	SW	yes	" "	46	CC		15	7.10	1450	5.2	"	yes
10/27	0915	MT	Windy	yes	" "	50	CC		7	8.00	1300	4.5	"	NO
11/16	1250	MT	Cold	yes	" "	50	CC		10.0	7.27	1300	4.6	"	NO
12/9	1514	GM	Cold	NO	Pipe from well to stock pipe is Frozen.								—	NO
1/14/94	1357	GM	Cold Clear	NO	Pipe is still Frozen.								—	NO
2/28	1240	GM	PC, Cold	NO	"								—	NO
3/31/94	13 05	CW/TMM	Warm, Sunny	NO	OUT OF COMMISSION; UNSUITABLE Due to MAINTENANCE								—	NO
4/19	1541	CW/GM	" "	NO	" "									NO
5/31/94	1335	RE	cool, windy	NO	the well is out of operation the pump is pulled									NO
6/27/94	1205	GM	Sunny Hot	yes		~50			17.2	7.63	1710	7.2	Pump House	yes
7/21/94	1029	GM	Sunny Hot	yes		~50			15.0	6.37	1790	8.8	"	NO
8/22/94	1224	GM	Sunny Hot	yes	Well is spraying inside fence N/A				18.3	7.97	1225	7.9	"	NO
9/27/94	1133	RB6	sunny cool	NO	well turned on & off after sample	NA			14.7	7.65	1510.7 (corr.)	9.4	"	yes
10/19/94	1436	RB6/GM	cloudy, cool	NO	wells not in use;	NA			12.2	8.41	644.0	7.8		yes
11/21/94	1111	RB6/RE6	overcast, cool	no	well not in use	NA			7.1	8.10	1215	10.9		no

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Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah
Groundwater Discharge Permit Number UGW070002
Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: 004 (CONT) UPDES

(Runoff Basin) Spring / Other: Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
3/31/94	10:41	CW/TMM	Nrm, Sunny	No	QUITTAH U Dry									NO
4/19/94	1604	GM/CW	" "	NO	Basin is nearly Empty (Ice)		(ice)							NO
4/29/94	1133	CW	rain + mud	No	Outfall is dry									NO
5/17/94	1115	CW	overcst, cool	No	Basin is dry									No
5/31/94	1425	RG	rain	NO	Basin is dry									NO
6/8/94	1428	RG	Clear Warm	NO	Basin is Dry									NO
6/23/94	1250	GM	Sunny Hot	NO	Basin is Dry									NO
7/19/94	1607	RG	Clear Hot	NO	Dry. (Installed Measur & Staff									No
7/20/94	1611	GM	Sunny Hot	NO	Dry.									NO
8/9/94	1420	RG	Warm PC	NO	Some Puddles									NO
8/23/94	1239	GM	Sunny Hot	NO	Dry									NO
9/29/94	0920	RBG	cloudy, cool	NO	Dry (outfall) Basin - puddles									NO
10/19/94	1502	RBG/GW	cloudy/cool	NO	outfall dry, Basin - .05' H_2O									NO
11/01/94	1544	RBG	cloudy, cool	NO	outfall dry, Basin - ≈1' H_2O									NO
11/21/94	1044	RBG/REG	overcast, cool	NO	basin - frozen H_2O; no H_2O level									NO

* Basin water level measurements are taken from permanent reference point at basin location.
Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah
Groundwater Discharge Permit Number UGW070002
Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: 007 Rail Cut Pond UPDES

(Runoff Basin) Spring / Other: Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
2/24/94	1146	GM	Sunny Cool	NO	Basin is Damp									NO
2/28	1417	GM	PC, Cool	NO	Basin is Damp									NO
3/16/94	1144	GM	PC, WARM	NO	Basin is Dry									NO
3/31/94	11:30	CW/TMM	WARM, SUNNY	NO	NO WATER IN BASIN									NO
4/19	1507	CW/GM	" "	NO	Dry Basin									NO
4/29	1213	CW	rain & sun	NO	Some rain water present in basin									NO
5/17/94	1044	CW	overcast/cool	NO	Basin is dry									NO
5/31/94	1203	RL	rain	NO	Basin is dry									NO
6/8/94	1557	RG	Clear Warm	NO	Basin is Dry									NO
6/23/94	1046	GM	Sunny Hot	NO	Basin is Dry									NO
7/11/94	1811	RG	Clear Hot	NO	Dry									NO
7/21/94	1022	GM	Sunny Hot	NO	Dry									NO
8/9/94	1705	RG	Warm, PC	NO	~10" of water									NO
8/22/94	1532	GM	Sunny Hot	NO	Muddy, No standing water									NO
9/29/94	0820	RB6	cloudy, cool	NO	basin is dry									NO
10/19/94	1337	RB6/GM	cloudy, cool	NO	Discharge pt. damp; basin-shallow H2O									NO
11/01/94	1620	RB6	cloudy, cool	NO	Discharge pt. dry basin-puddles small									NO
11/2/94	1137	RB6/RE6	overcast, cool	NO	basin-muddy floor									NO

* Basin water level measurements are taken from permanent reference point at basin location.
Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah

Groundwater Discharge Permit Number UGW070002

Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: 008 Old Coarse Refuse Pond UPDES

(Runoff Basin) Spring / Other:

Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
2/28/94	1445	GM	PC Cool	NO	Basin is Damp.									NO
3/16/94	1137	GM	PC, WARM.	NO	BASIN IS DRY									NO
3/31/94	11:02	CW/TMM	Warm, SUNNY	NO	POND NO WATER									NO
4/19	1559	CW/GM	" "	NO	Dry Basin									NO
4/29	1246	CW	rain+muddy	No	rain water in Basin									NO
5/17/94	1104	CW	overcast/cool	NO	Basin is dry									NO
5/31/94	1412	RG	rain	NO	Basin is dry									NO
6/8/94	1449	RG	Clear Warm	NO	Basin is Dry									NO
6/23/94	1257	GM	Sunny Hot	NO	Basin is Dry									NO
7/11/94	1547	RG	Clear Hot	NO	Dry									NO
7/21/94	1620	GM	Sunny Hot	NO	Dry									NO
8/9/94	1456	RG	Warm, PC	NO	2' of water at standpipe									NO
8/23	1243	GM	Sunny Hot	NO	Dry (SL. Muddy)									NO
9/29/94	0935	RBG	cloudy, cool	NO	outfall-dry basin-dry w/mud									NO
10/19/94	1516	RBG/GM	cloudy, cool	NO	outfall-dry basin-½-2" H_2O									NO
11/01/94	1531	RBG	cloudy, cool	NO	basin-muddy w/ puddles									NO
11/21/94	1054	RBG/REG	overcast, cool	NO	basin-frozen puddles									NO

* Basin water level measurements are taken from permanent reference point at basin location.

Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah
Groundwater Discharge Permit Number UGW070002
Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: 009 Pasture Pond UPDES

Runoff Basin / Spring / Other:

Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
2/28/94	1440	GM	~~PC~~ Cool	NO	Basin is Damp.									NO
3/16/94	1129	GM	PC WARM	NO	BASIN IS MUST									NO
3/31/94	10:53	CW/GM	Warm, Sunny	NO	POND DRY									NO
4/19/94	1553	CW/GM	" "	NO	Dry Pond.									NO
4/29/94	1237	CW	rain & mud	No	Some water in basin									No
5/17/94	1105	CW	Overcast/cool	No	Basin is dry									No
5/31/94	1350	RG	rain	No	6" of water in basin									No
6/8/94	1422	RG	Warm Clear	NO	1' of water in Basin									NO
6/23/94	1252	GM	Sunny Hot	NO	6" of water in basin									NO
7/11/94	1527	RG	Clear Hot	NO	Dry									NO
7/20/94	1608	GM	Sunny Hot	NO	Dry									NO
8/9/94	1517	RG	Warm, PC	NO	1-2' of water in Basin									NO
8/23	1236	GM	Sunny/Hot	NO	1-2' of water in Basin									NO
9/29/94	0912	RBG	cloudy, cool	NO	basin contains shallow H_2O									NO
10/9/94	1452	RB6/GM	Cloudy, cool	NO	outfall - dry basin - shallow H_2O									NO
11/01/94	1558	RB6	cloudy, cool	NO	basin - >1' H_2O									NO
11/21/94	1043	RB6/RE6	overcast, cool	NO	basin ≈ 6" H_2O, ice									NO

* Basin water level measurements are taken from permanent reference point at basin location
Flow measurement methods W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah
Groundwater Discharge Permit Number UGW070002
Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: 012 Coarse Refuse Toe UPDES

(Runoff Basin) Spring / Other: Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
2/28	1414	GM	PC Cool	NO	1'-2' of Water in Basin									NO
3/16/94	1147	GM	PC WARM	NO	1' WATER IN BASIN									NO
3/31/94	11:35	CW/TMM	warm, Sunny	NO	WATER IN BASIN									NO
4/19/94	1447	CW/GM	" "	NO	6" of water in Basin									NO
4/29/94	1218	CW	rain + mud	NO	rain water present in basin									NO
5/17/94	1047	CW	overst/cool	NO	water in basin, no discharge									NO
5/31/94	1155	RG	rain	NO	4" of water in basin									NO
6/8/94	1550	RG	Warm Clear	NO	6" of water in basin									NO
6/23/94	1048	GM	Sunny Hot	NO	6" of Water in basin									NO
7/1/94	1740	RG	Clear Hot	NO	Dry									NO
7/21/94	1020	GM	Sunny Hot	NO	Dry									NO
8/9/94	1647	RG	Warm, PC	NO	1' of Water									NO
8/22/94	1535	GM	Sunny Hot	NO	1' of water in Basin									NO
9/29/94	0835	RBG	cloudy, cool	NO	Basin has ≈ 1' of water									NO
10/19/94	1400	RBG/GM	cloudy, cool	NO	outfall - dry basin - 2-3" H_2O									NO
11/01/94	1625	RBG	Cloudy, cool	NO	outfall - dry basin ≈ 1-2' H_2O									NO
11/21/94	1156	RBG/REG	overcast, cool	NO	basin - frozen H_2O									NO

* Basin water level measurements are taken from permanent reference point at basin location.
Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah
Groundwater Discharge Permit Number UGW070002
Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: 013 Facility Sed Pond.

(Runoff Basin) Spring / Other:

Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
2/28	1436	GM	PC, Cool	NO	3' below Red Stripe									NO
3/16/94	1125	GM	PC, Warm.	No	WL ≈ 4.5 below red stripe									No
3/31/94	10:47	CW/GMM	Warm, Sunny	NO.	WATER IN BASIN									No.
4/19/94	1545	CW/GM	" "	No	water 5' below R.S.									No.
4/29/94	1157	CW	rain & mud	No	water 5' below R.S.									No
5/17/94	1057	CW	dust / cool	No	water in basin is 7' below outlet pipe									No
5/31/94	1337	RG	rain	No	1-2' of water in basin									No
6/8/94	1405	RG	Warm Clear	NO	1-2' of water in basin									No
6/23/94	1240	GM	Sunny Hot	NO	1' of water in basin									NO
7/11/94	1520	RG	Clear Hot	NO	6"-8" of water									NO
7/20/94	1603	GM	Sunny Hot	NO	Less-4) inches of water									No
8/9/94	1507	RG	Warm PC	NO	2-3' of water in basin									No
8/23/94	1232	GM	Sunny, Hot	NO	2' of water pumping to Rep.									NO
9/29/94	0900	RBG	cloudy, cool	NO	Basin has ≈ 1' of water									NO
10/19/94	1445	RBG/GM	cloudy, cool	NO	Basin - 2-3" below red mark									NO
11/6/94	1551	RBG	cloudy, cool	NO	Basin - 2-3' H_2O									NO
11/2/94	1035	RBG/REG	overcast, cool	NO	basin - frozen H_2O									NO

* Basin water level measurements are taken from permanent reference point at basin location.
Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah

Groundwater Discharge Permit Number UGW070002

Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: 014 Coal Pile Sed Pond UPDES

Runoff Basin / Spring / Other: Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
2/28	1438	GM	PC Cool	NO	1' below overspill									NO
3/16/94	1126	GM	PC Warm	No	2" below overspill pipe									NO
5/31/94	10:56	CW/GM	Warm, Sunny	NO	WATER IN POND									NO
4/19/94	1548	CW/GM	" "	NO	Water 2' below overflow pipe									NO
4/25/94	1151	CW	rain & hail	NO	Water within 2' of discharge pipe									NO
5/17/94	1059	CW	overcast/cool	NO	pond is nearly full									NO
5/31/94	1345	RG	rain	NO	6" of water in basin									NO
6/8/94	1415	RG	Warm Clear	NO	6" of water in basin									NO
6/23/94	1242	GM	Sunny Hot	NO	6" of water in basin									NO
7/4/94	1525	RG	clear Hot	NO	3" of water in basin									NO
7/20/94	1606	GM	Sunny Hot	NO	Dry Basin									NO
7/9/94	1512	RG	Warm PC	NO	≈ 1' of water									NO
7/23/94	1237	GM	Sunny Hot	NO	2" of water in places									NO
9/29/94	0907	RBG	cloudy, cool	NO	≈ 1' of water in basin									NO
10/9/94	1450	RBG/GM	cloudy, cool	NO	outfall - puddles basin - 6" H_2O									NO
11/01/94	1555	RBG	cloudy, cool	NO	discharge pt. - clay basin - 1" H_2O									NO
11/21/94	1045	RBG/REG	overcast, cool	NO	point being dug out									NO

* Basin water level measurements are taken from permanent reference point at basin location.

Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah
Groundwater Discharge Permit Number UGW070002
Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: 015 Landfill Sed Pond UPDES

(Runoff Basin) Spring / Other:

Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
3/22	1328	GM	PC Cool	NO	Damp Basin									NO
3/16/94	1159	GM	PC Warm	NO	Basin is Dry									NO
3/31/94	11:21	CW/TMM	Warm, Sunny	NO	NO WATER IN BASIN, ASH IN BASIN									NO
4/19/94	1145	CW/GM	" "	NO	Basin is Dry									NO
4/25/94	1226	CW	Rain & Warm	NO	rain water in low areas									NO
5/17/94	1032	CW	Overcast/Cool	NO	Basin is Dry									NO
5/31/94	1125	RG	light rain	NO	Basin is dry									NO
6/8/94	1612	RG	Warm Clear	NO	Basin is Dry									NO
6/23/94	0920	GM	Sunny Hot	NO	Basin is Dry									NO
7/11/94	1722	RG	Clear Hot	NO	Dry Basin									NO
7/20/94	1220	GM	Sunny Hot	NO	Dry Basin									NO
7/29/94	1255	RG	Warm PC	NO	Dry									NO
7/22/94	1350	CSM	Sunny Hot.	NO	Dry									NO
9/29/94	0847	RBG	cloudy, cool	NO	Basin is dry									NO
10/19/94	1219	RBG/GM	cloudy, cool	NO	outfall - dry basin - 9" H_2O									NO
11/01/94	1608	RBG	cloudy, cool	NO	outfall - dry basin 5" H_2O									NO
11/21/94	1415	RBG/REG	overcast, cool	NO	basin - 2" H_2O, ice on bottom									NO

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Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate

SUNNYSIDE COGENERATION ASSOCIATES FACILITY

Carbon County, Utah
Groundwater Discharge Permit Number UGW070002
Surface Water and Discharge Basin Compliance Sampling

HUNTINGDON Chen – Northern

MONITORING LOCATION NUMBER: 016 Borrow Area Pond UPDES

(Runoff Basin) Spring / Other: Sampling Parameters:

Date	Time	Personnel	Weather	Discharge Present (yes/no)	Observations (color, sheen, odor, etc.)	Flow (cfs)	Flow Meas. Method	Basin Water Level (feet)	Field Parameters: Temp (°C)	pH	SC (umhos)	DO Meter No.	Collection Point	Sample Taken (yes/no)
2/25	~~1443~~	GM	PC, Cold	NO	Basin is Dry.									NO
3/16/94	1136	GM	PC, WARM	NO	BASIN IS DRY									NO
3/31/94	1100	CW/TMM	WARM, SUNNY	NO	NO WATER IN Pond									NO
4/19/94	1556	CW/GM	" "	NO	Dry Basin									NO
4/29/94	1240	CW	rain & hail	NO	Minor water puddles in basin									NO
5/17/94	1108	CW	overcast/cool	NO	Basin is Dry									NO
5/31/94	1357	RG	rain	NO	Basin is Dry									NO
6/8/94	1442	RG	Warm Clear	NO	Basin is Dry									NO
6/27/94	1259	GM	Sunny Hot	NO	Basin is Dry									NO
7/11/94	1538	RG	Clear Hot	NO	Dry									NO
7/20/94	1617	GM	Sunny, Hot	NO	Dry									NO
8/9/94	1445	RG	Warm PC	NO	3" of water									NO
8/23	1241	GM	Sunny/Hot.	NO	Dry									NO
9/29/94	0930	RBG	cloudy cool	NO	Basin is dry									NO
10/19/94	1510	RBG/GM	cloudy cool	NO	Basin - dry									NO
11/21/94	1538	RBG	cloudy cool	NO	Basin dry									NO
11/21/94	1050	RBG/REG	overcast, cool	NO	basin dry snow on bottom									NO

* Basin water level measurements are taken from permanent reference point at basin location.
Flow measurement methods: W = Weir, VE = Visual Estimate, CC = Calibrated Container, DF = Debris Flow Rate Estimate