ATTACHMENT 2

45

NUREG-0737 TOPIC III.D.3.4
CONTROL ROOM HABITABILITY

R. E. GINNA NUCLEAR POWER PLANT

Rochester Gas & Electric Corporation

September 1981

RG&E Response to NUREG 0737 Topic III.D.3.4, Control Room Habitability Requirements

1.0 Summary and Conclusions

An evaluation has been performed to assess the impact upon control room habitability of the postulated accidental release of toxic gases either onsite or offsite, and of radioactivity releases resulting from the design basis loss-of-coolant accident. The toxic gas accident analysis accounted for potentially significant hazardous chemicals identified on the Ginna site and within 5 miles of the plant.

The results of the radiological evaluation indicate acceptable post-accident doses to control room operators if credit is taken for the operation of the control room ventilation/filtration system. Modifications are proposed for more rapid control room isolation capability to assure acceptable operator doses, even in the event the ventilation/filtration system is assumed to be inoperable.

The toxic chemical evaluation has identified potentially high control room concentrations of chlorine and ammonia from offsite and onsite sources, respectively. Preliminary modification recommendations include provisions for rapid detection of these chemicals, along with the capability to automatically isolate the control room ventilation from the outside environment.

Additional areas warranting modifications or further investigation are also discussed. These include ductwork modifications to provide additional assurance that an appropriate portion of recirculated control building air is being filtered, and an investigation to improve the residence time of air flowing through the control room charcoal filter banks.

2.0 Radiological Analysis

Table A presents cases evaluated in the Ginna control room habitability study which are pertinent to the discussion of suggested modifications which follows. Case 1 approximates the present control room system configuration as described under Appendix A, Item 1: Mode of Operation. It is seen that with credit taken for the operation of the control room ventilation/filtration system, the General Design Criteria - 19 (GDC-19) limits for thyroid and whole body dose are met following a postulated loss-of-coolant accident. This includes dose contributions from airborne radioactive materials inhaled and from direct radiation. The dose contribution due to emergency safety feature (ESF) leakage was determined to be approximately 5 percent of the thyroid dose, and approximately 1 percent of the whole body dose.

Case 2 is presented to show the doses resulting from assumed unavailability of control room air filtration following an accident. In this case, the effects of two proposed modifications are apparent. First, it is assumed that rapid control room isolation can be achieved by relocating radiation detection equipment nearer to the control building outside make-up air intake. Secondly, a smaller-sized inlet damper is assumed, which limits the maximum outside air flow into the control building prior to post-accident isolation. The thyroid and whole body doses are shown to be within the GDC-19 guidelines. The assumptions used in arriving at these conclusions are shown on Table A. Additional information requested by Attachment 1 to NUREG-0737, Item III.D.3.4, is included in Appendix A of this report.

TABLE A - Assumptions and Results of Ginna Control Room Habitability Radiological Evaluation

Parameter	Case 1	Case 2
Reactor Power (MWt)	1520	1520
Halogens: El/Or/Part fraction	.91/.04/.05	.91/.04/.05
Spray initiation/duration (min)	2/28	2/28
Halogen removal - Spray (hr^{-1})	10	10
CV recirc. filter credit	Yes	Yes
CV volume leak rate (1st day)	0.002/day	0.002/day
CV volume leak rate (thereafter)	0.001/day	0.001/day
0-8 hr X/Q (sec/m^3)	1.9×10^{-4}	1.9×10^{-4}
Pre-isolation CR intake (cfm)	16,000	2,000
CR isolation time (sec)	30	0
Unfiltered in-leakage (hr^{-1})	0.06	0.06
Recirc. rate (90% filter)	2048 cfm	0 cfm
Breathing rate (m^3/sec)	3.47×10^{-4}	3.47×10^{-4}
Occupancy	partial	partial
Thyroid dose (rem)	8.7	15.3
Whole body dose (rem)	1.0	1.0
GDC-19 limits:		
Thyroid dose (rem)	30	30
Whole body (rem)	5	5

3.0 Onsite Toxic Chemical Survey and Analysis

3.1 Onsite Chemical Survey

Sources of chemicals identified during the Ginna onsite chemical survey included:

- a 500 gallon anhydrous ammonia tank located next to the AVT building about 40 meters from the control room intake,
- a pair of 6,000 gallon tanks of 98% H_2SO_4 and 50% NaOH located in the AVT building about 40 meters from the control room and another pair in the primary water treatment plant about 100 meters from the intake,
- several 55 gallon drums of 30%, NH_4OH, 50 gallon drums of 15% NH_4OH and 5% N_2H_4, and a 35 gallon drum of 35% N_2H_4 located in the turbine building about 75 meters from the intake, a variety of gas bottles maintained throughout the plant, and the bromotrifluoromethane tanks outside the computer room.
- an underground sodium hypochlorite tank located near the plant screen house.

The effect of each of these on control room habitability is discussed in Section 3.2. Drawings indicating the locations of onsite chemicals are contained in Appendix B.

3.2 Onsite Chemical Hazards Evaluation

Toxic chemicals were evaluated in a manner similar to that performed for radioactivity. For each chemical, applicable toxicity limits were identified, both catastrophic and slow leak accidents were hypothesized and the resulting "puff" or "plume" was modeled using appropriate diffusion equations.

a. It was determined that the 500 gallons of anhydrous ammonia stored near the AVT building poses a potentially significant problem with respect to control room concentrations following a postulated anhydrous ammonia tank or line rupture. Post-accident control room ammonia concentrations were calculated to exceed a toxicity limit of 70 mg/m^3 following either type of rupture. It has been concluded that modifications are needed to provide the means to rapidly detect and isolate the control room in the presence of high outside ammonia concentrations. Furthermore, it has been recommended that additional measures

be investigated addressing the ammonia hazard. They may include additional diffusion analysis, in leakage verification, chemical substitution, tank enclosure or tank relocation.

b. The 6,000 gallon tanks of H_2SO_4 and NaOH stored in the AVT building are contained in separate areas of large enough volume to contain the entire contents of both tanks. Each area is drained to a common sump through separate lines. Valves in the lines are maintained in the closed position so that no mixing of the NaOH and H_2SO_4 is likely to occur. H_2SO_4 is not considered a hazard to the control room operator unless heated as the result of dilution or mixture with caustic. Neither is likely to occur.

c. The 6,000 gallon tanks of H_2SO_4 and NaOH stored in the primary water treatment facility sit next to each other about 100 meters from the intake. Spills would be drained to the building floor drains leading to an underground retention tank. These tanks are not considered a hazard to control room personnel.

d. The drums of NH_4OH and N_2H_4 are dilute and stored in small quantities and thus are not considered a hazard.

e. There are numerous gas bottles throughout the Ginna site (see Appendix B). Individually, they do not pose a threat to the operators. There is a large number of bottles stored in the main storage location on the north side of the turbine building. These are securely attached to a number of metal racks which are themselves attached to the walls and floor. There is not a potential for damage to a large number of bottles as the result of a single event. Additional hydrogen bottles are stored and properly secured to the east and south of the Auxiliary Building.

f. The fire protection system used in the relay and computer rooms consists of two separate manually actuated Halon 1301 systems. Bromotrifluoromethane is the fire control agent. It is not generally considered a toxic hazard except as an asphyxiant. The gas is much heavier than air and unless it is stirred up, it will settle to the floor. The control room is above the computer room. The system should not be activated unless a fire has been detected isolating the control room from the computer room. However, if it is assumed that half the gas (640 pounds) is injected to an unisolated computer room and that the gas is well mixed, concentrations as high as 2×10^5 mg/m^3 may be attained. This is less than the generally accepted limit for protective action (requiring use of self-contained breathing apparatus) of 5.9×10^5 mg/m^3. The Halon 1301 system does not pose a threat to control room habitability.

g. An underground sodium hypochlorite tank is located near the Screenhouse. The tank contents are not highly volatile and do not pose a hazard to control room operators.

4.0 Offsite Toxic Chemical Survey and Analysis

4.1 Offsite Chemical Survey

A survey of toxic chemical sources within a five mile radius of the Ginna site was performed by RG&E personnel following a procedure described in Appendix C.

Federal, state, and local agencies were contacted concerning their knowledge of toxic chemicals stored or transported through the area. A railroad spur and Route 104 pass about 3.5 miles from the site (see Appendix C). Companies that may use these routes were contacted.

The responses generated by the survey are documented in Appendix C.

a. The following chemicals were identified as in use by local fruit growers:

   - Guthion in 2 1/2 pound cases
   - Vydate in 1 and 5 gallon cans
   - Lannate in 1 and 5 gallon cans
   - Methamidophos in 1 and 5 gallon cans
   - Parathion in 5 gallon cans
   - Furadan in 50 pound bags and 1 gallon cans
   - Termik in 30 pound bags
   - Demeton in 2 gallon cans

   These are transported to local distribution firms about 50 times per year.

b. The following chemicals are located in the Ontario Agway Store about four miles from the site:

   - various pesticides in small containers
   - liquid swimming pool chlorine
   - 4,000 gallons of Nitan (32% nitrogen solution split evenly between urea and ammonium nitrate).

c. The Town of Ontario's Water Plant about 1.1 miles from the site stores chlorine in two 2,000 pound tanks. One tank is refilled each month from a truck containing 2,750 pounds of chlorine housed in a 2,000 pound cylinder and five 150 pound cylinders.

d. The Coast Guard does not maintain records of chemical transport on the lake. The normal shipping lanes are about 40 miles from the shore. Vessels which may contain toxic chemicals are not normally seen from the vicinity of the site.

e. Conrail has not researched traffic on the spur. They will do so when time is available. This spur is only lightly used and should not present a hazard.

4.2 Offsite Chemical Hazards Evaluation

a. The 2,000 lb. tanks of liquid chlorine do pose a potential hazard to Ginna control room habitability, following a postulated catastrophic rupture with stable meteorology and no assumed chlorine detection system in proximity to the control room ventilation intake. Following such a rupture, control room concentrations were calculated to exceed the short and long-term toxicity limits (45 and 12 mg/m^3, respectively) with the present control room design. It has been determined that a modification to provide rapid chlorine detection and isolation capability would adequately ensure acceptable post-accident concentrations in the control room.

b. The truck which refills the chlorine tanks transports quantities of chlorine similar to those stored in each tank at the Ontario water treatment plant site. Because these trucks transport the chlorine via Route 104, no additional hazard is presented beyond that already discussed in the previous paragraph.

c. The chemicals in use by local fruit growers such as Guthion, Vydate, Parathion, and Demetron are generally solids stored in small containers. They are not stored in large quantities anywhere in the Ginna area.

d. The chemicals stored at the Ontario Agway Store consisted of pesticides such as those above stored in small containers, liquid swimming pool chlorine and 4,000 gallons of Nitan. The small commercial quantities of pesticides and swimming pool chlorine are not considered to be toxic hazards. Nitan is a liquid with a low vapor pressure at normal temperatures and pressures and does not present a threat to control room habitability.

5.0 <u>Modifications and Further Investigations Relative to Control Room Habitability</u>

Evaluations of control room habitability for the Ginna plant have been performed under the SEP by NRC staff (see letter from D. M. Crutchfield to J. E. Maier, "Ginna SEP Topics VI-8 and II.1.C", received January 19, 1981) and subsequently by Rochester Gas and Electric Corporation (contained herein). The following is a discussion of modifications presently contemplated based upon the result of these evaluations.

5.1 Radiological Hazards

The draft SEP Topic VI-8 evaluation cited above concluded the following with regard to radiological protection afforded by the Ginna control room design:

> "Although the margin of protection to operators for recently licensed plants is required to be greater, the Ginna control room habitability design provides substantial protection to the operators in the event of accidents involving radiological releases from the plant by isolation and recirculation. The design assures that, except under rarely occurring meteorological conditions in coincidence with accidental radioactive releases that are unlikely to occur even in the event of a Design Basis Accident, the operators wil not receive excessive doses. Highly unlikely events involving sequences of postuated successive failures more severe than those postulated for the design basis could potentially result in severe exposures to control room operators, however, the probability of this occurrence is so low that they are not considered in the design of nuclear power plants.
>
> In view of the substantial level of protection provided to the control room operators and the low probability of excessive exposures to the operators, we conclude that it is not mandatory to take any immediate measures to provide additional protection to the operators."

The control room radiological hazards evaluation performed by Rochester Gas and Electric has also confirmed that the current system and structural design provides considerable operator protection from direct radiation and airborne radioactivity. Nevertheless, in view of current design requirements, such as Standard Review Plan 6.4, it has been deemed appropriate to consider system modifications to assure that post-accident operator doses will be maintained at acceptable levels. Specifically, we have proposed a modification concept to:

1) Provide a more rapid post-accident detection capability prior to the buildup of significant radioactivity levels inside the Ginna control room. This will be achieved by the installation of a detection system in closer proximity to the control building ventilation intake, with automatic isolation capability;

2) Limit the maximum intake rate of outside air in order to ensure adequate damper isolation time in the event of a high radiation signal. This will require the installation of a new, smaller-sized damper placed at an appropriate distance from the post-accident radiation detector location.

It is expected that these modifications can be completed by July 1, 1983.

5.2 Onsite Chemical Hazards

The NRC draft evaluation for SEP Topic VI-8 identified the onsite 500-gallon anhydrous ammonia tank as a potentially significant impediment to control room habitability. The SEP draft evaluation concluded:

> "We believe minimum impact on the licensee would result by the installation of ammonia detectors in the control room intake or a detection devices [sic] at the tank to alarm ammonia release, and alert the operators to don self-contained breathing apparatus. The need for additional improvements, such as closure of the control room inlet dampers on high ammonia concentration in the inlet ducts or upon a tank failure signal, a collection system for accidentally released ammonia (water adsorption or a containment around the tank), or relocation of the tank, should be determined during the integrated safety assessment for Ginna."

We concur with the identified need to provide for ammonia detection capability, and to investigate other means to further reduce potentially excessive control room ammonia concentrations. Accordingly, the following are planned to address this issue:

1) Installation of an ammonia sensor system for the rapid detection of high ammonia releases in proximity to the control room ventilation intake or the outside storage tank;

2) Provide automatic isolation capability of the control building ventilation system in the presence of high ammonia concentration;

3) Investigation of additional measures to reduce the anhydrous ammonia hazard. Such options include additional atmospheric diffusion analysis, control room in-leakage verification, chemical substitution, tank enclosure or tank relocation.

It is anticipated that the above modifications (1 and 2) can be completed by July 1, 1983. The investigation of optional measures to further reduce ammonia hazards will be completed by July 1, 1982.

5.3 Offsite Chemical Hazards

Due to the potentially significant chlorine concentrations resulting from a postulated tank rupture at the 1.1-mile distant Ontario water treatment plant, a need for the following modifications has been identified:

1) Provide a chlorine sensor system for the rapid detection of high chlorine concentrations outside the control building ventilation system intake;

2) Provide the capability to automatically isolate the control building ventilation system upon detection of high chlorine concentration.

These modifications are expected to be completed by July 1, 1983.

5.4 Additional Investigations

Other areas pertinent to the issue of control room habitability have been identified which we conclude warrant further investigation.

1) A modification has been initiated to alter a portion of the control building ventilation/filtration ductwork in order to provide added assurance that adequate system return air is directed through the HEPA and charcoal filter unit in the post-accident operation mode. This modification is presently scheduled for completion during the 1982 refueling outage.

2) We will also investigate whether proper residence time is being maintained in the control building charcoal filter banks and propose corrective measures if needed. This investigation will be completed by July 1, 1982.

Appendix A
to Attachment 2

Information Required for Control Room
Habitability Evaluation - NUREG-0737
Topic III.D.3.4

R. E. Ginna Nuclear Power Plant

Appendix A to Attachment 2
Information Required for Control Room Habitability
Evaluation - NUREG-0737 III.D.3.4

(1) Control Room Mode of Operation

The following is the information requested in Attachment 1 to NUREG-0737, Item III.D.3.4.

The control room atmosphere is filtered, heated and cooled as required by a separate ventilation system. This system circulates air from the control room, control room office and kitchen, and computer room through return air duct work to a central air conditioning unit located adjacent to the battery room. The air is drawn into the unit through roughing type filters, and either heatd or cooled as required by steam heating or chilled water coils. Conditioned air is directed back to the rooms through a supply air ductwork system. Room air turnover rates provided by this system are approximately as follows:

Control room	20 per hour
Office and kitchen	10 per hour
Computer room	36 per hour

During normal operation fresh makeup air is admitted to this system through an intake louver located above the control building ceiling, the amount varying between 15 and 100 percent of the unit flow rate, depending on outside air temperature. Pneumatically operated dampers can be positioned from the control room to isolate the fresh air intake and to place a separate charcoal filter unit in service.

The charcoal filter unit includes both high efficiency particulate air (HEPA) and charcoal filters for removing radioactive particulates from the control room atmosphere. In the event of high radiation levels in the control room, the control room radiation monitor (set at 2 mR/hr) will automatically close the dampers in the fresh air intake duct and in the return air duct to the Turbine Building and will open the damper in the charcoal filter unit inlet duct. This signal will also start a separate fan to provide flow through the charcoal filter unit. Until radioactivity in the control room atmosphere is reduced to a safe level, system flow will be in a closed cycle from the control room, with a portion of bypass flow (assumed to be 2048 cfm in this analysis) through the charcoal filter unit, through the air conditioning unit and back to the control room. The dampers can also be positioned to permit fresh air makeup to the system through the charcoal filter unit. Since all control room penetrations, including doors, are designed to high leak tightness standards and the control room is maintained at essentially atmospheric pressure, the infiltration of contaminated air into the control room is limited to a very low rate (assumed to be 0.06 hr^{-1} in this evaluation).

(2) Control Room Characteristics

(a) Volume

Control Room:	39,520 ft^3
Computer Room:	6,264 ft^3
Equipment Room:	15,382 ft^3

(b) Control Room Emergency Zone

1) Control room emergency zone with pressurization will consist of the control room, computer room, and the equipment room.

2) Control room emergency zone without pressurization will consist of the control and computer rooms.

(c) Ventilation System Schematic

Refer to Figure A-1 enclosed.

(d) Infiltration Leakage Rate

The infiltration leakage rate has been assumed to be based upon 0.06 volume changes per hour (45.8 cfm) without pressurization.

(e) Assumed Charcoal Filter Efficiency

Containment recirculation filters (for iodine)

elemental	90%
organic	70%
particulate	90%

Control room, re circulation

90% for all species

(f) Distance Between Containment and Air Intake

Approximately 100 ft.

(g) Layout of Control Room, Air Intake, Containment Building, and Chlorine, or Other Chemical Storage Facility with Dimensions

Refer to enclosed figures in Appendix B.

(h) Control Room Shielding

The Control Room is shielded with 20-inch concrete south and west walls and ceiling, facing the Containment Building. There is no door facing the Containment Building, and no radiation streaming is expected through any penetrations between Containment and the Control Room. The Control Room north and east walls consist of 1/4-inch armor plate and steel siding.

(i) Automatic Isolation Capability - Damper Closing Time, Damper Leakage and Area

30 seconds is assumed for radiation detection and damper closure.

(j) Toxic Gas Detectors

None presently are installed to operate in conjunction with the Control Room ventilation system.

(k) Self-Contained Breathing Apparatus

There are two Scott Air-Paks and 2 bottles inside the Control Room; and four additional Scott Air-Pak units with 8 bottles located immediately outside.

(l) Bottled Air Supply

The Control Room is provided with two 300 ft^3 cylinders. Two additional 300 ft^3 cylinders are located outside the Control Room.

(m) Emergency Food and Potable Water Supply

The Control Room is provided with a kitchen having potable water and food supplies. A freezer containing a supply of TV dinners and other food items is maintained in the kitchen, and an additional food freezer is located immediately outside the Control Room. The SEP draft evaluation of SEP Topic VI-8 "Control Room Habitability" (January 19, 1981) concluded the Ginna Control Room "to be capable of maintaining an emergency team (at least 5 men) for at least 5 days, satisfying the guidelines of the SRP 6.4."

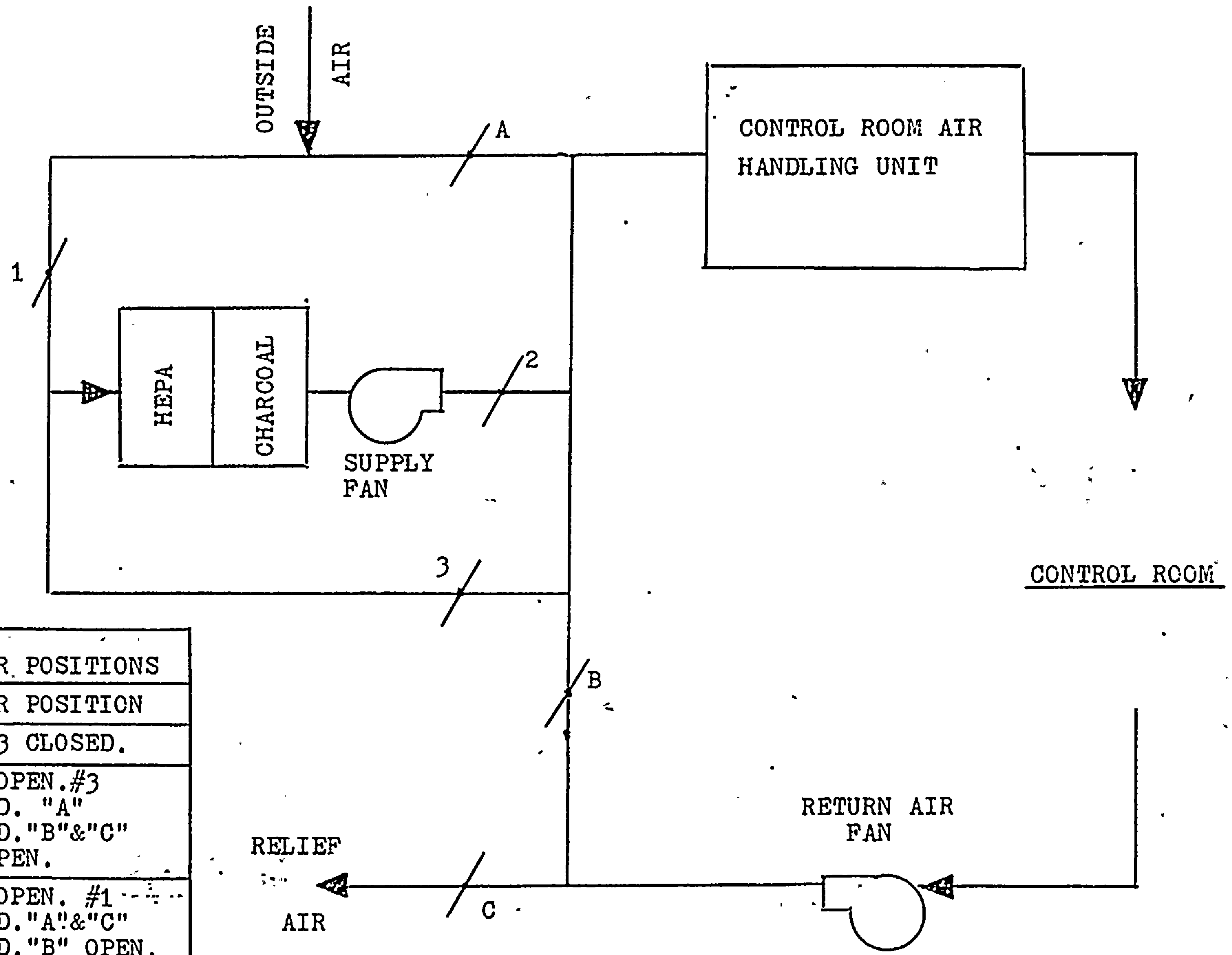
(n) Control Room Personnel Capacity (Normal and Emergency)

Normal - 3 individuals
Emergency - 5-8 individuals

(o) Potassium Iodine Drug Supply

A supply of approximately 150 KI tablets is maintained in the Control Room. Additional KI tablets are available on site.

GURE A-1 CONTROL BUILDING VENTILATIC LOW DIAGRAM



CONTROL ROOM DAMPER POSITIONS	
CONDITION	DAMPER POSITION
NORMAL	#1,2&3 CLOSED.
POST-ACCIDENT W/MIN. OUTSIDE AIR	#1&2 OPEN.#3 CLOSED. "A" CLOSED."B"&"C" 75% OPEN.
POST-ACCIDENT W/0% OUTSIDE AIR	#2&3 OPEN. #1 CLOSED."A"&"C" CLOSED."B" OPEN.

Appendix B
to Attachment 2

Onsite Toxic Chemical Survey

R. E. Ginna Nuclear Power Plant

Control Room Habitability Study

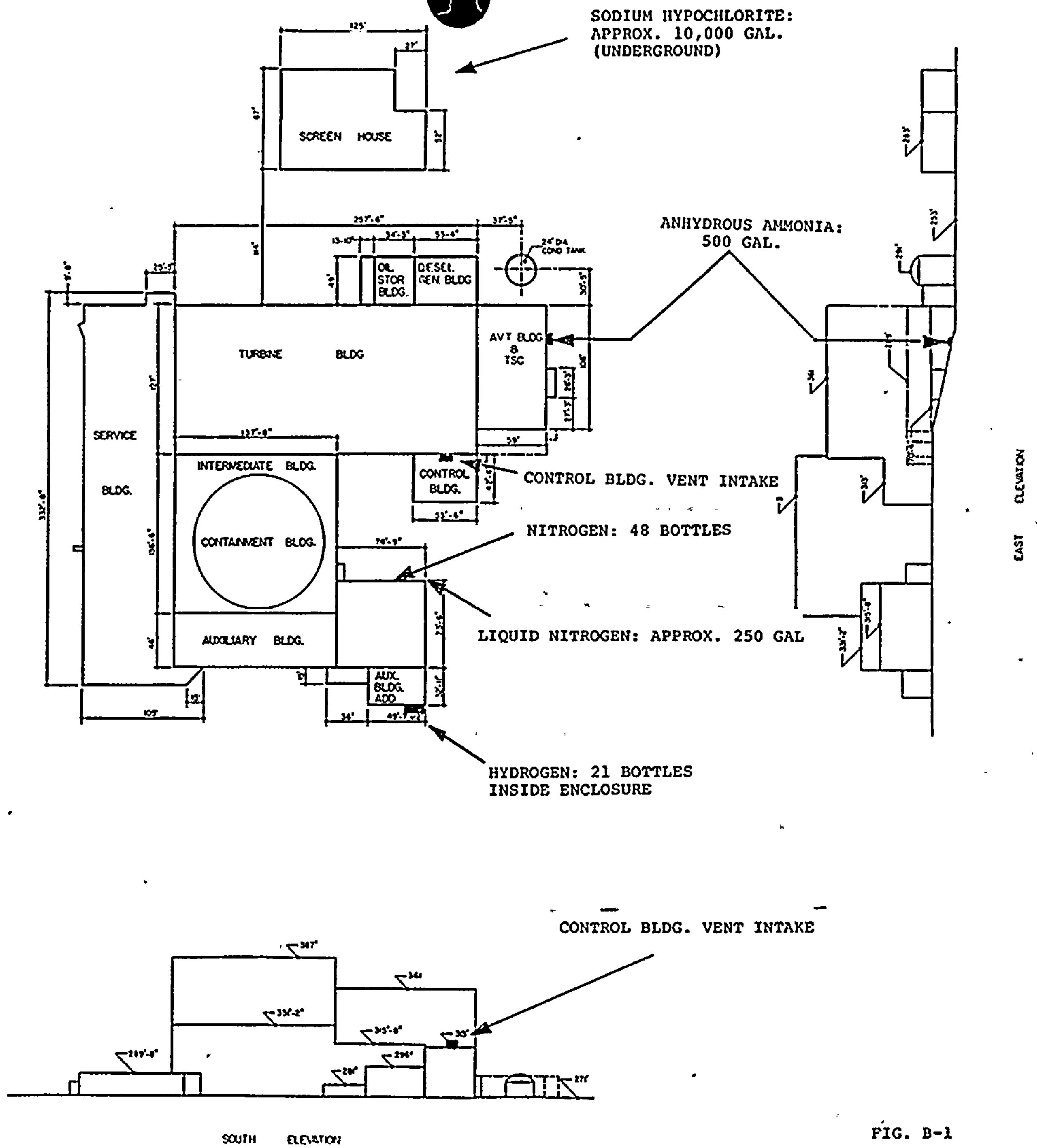

SODIUM HYPOCHLORITE: APPROX. 10,000 GAL. (UNDERGROUND)
SCREEN HOUSE
ANHYDROUS AMMONIA: 500 GAL.
OIL STOR BLDG.
DIESEL GEN BLDG
TURBINE BLDG
AVT BLDG & TSC
SERVICE BLDG.
INTERMEDIATE BLDG.
CONTAINMENT BLDG.
CONTROL BLDG.
CONTROL BLDG. VENT INTAKE
NITROGEN: 48 BOTTLES
LIQUID NITROGEN: APPROX. 250 GAL
AUXILIARY BLDG.
AUX. BLDG. ADD
HYDROGEN: 21 BOTTLES INSIDE ENCLOSURE
EAST ELEVATION
CONTROL BLDG. VENT INTAKE
SOUTH ELEVATION

FIG. B-1

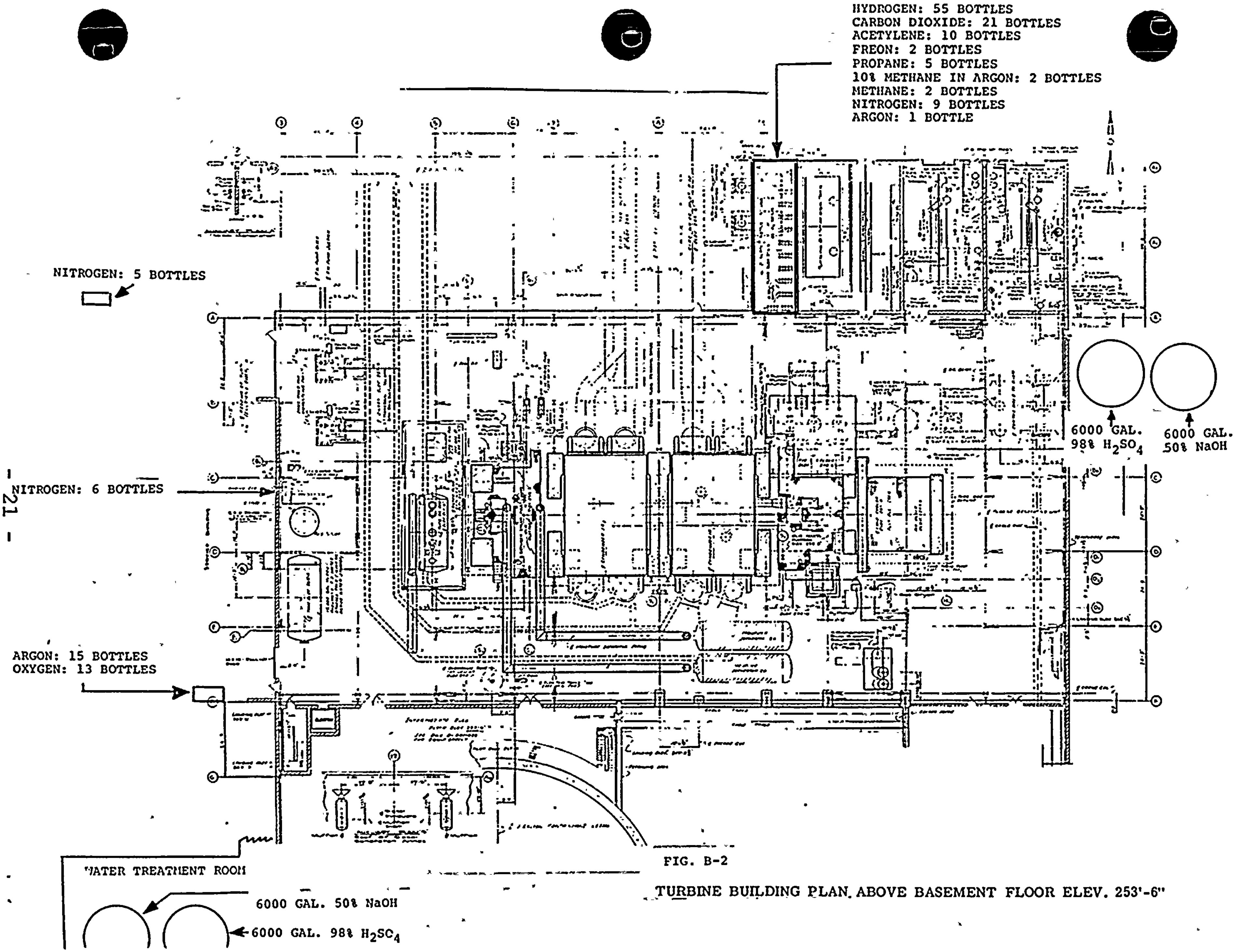


FIG. B-2

TURBINE BUILDING PLAN ABOVE BASEMENT FLOOR ELEV. 253'-6"

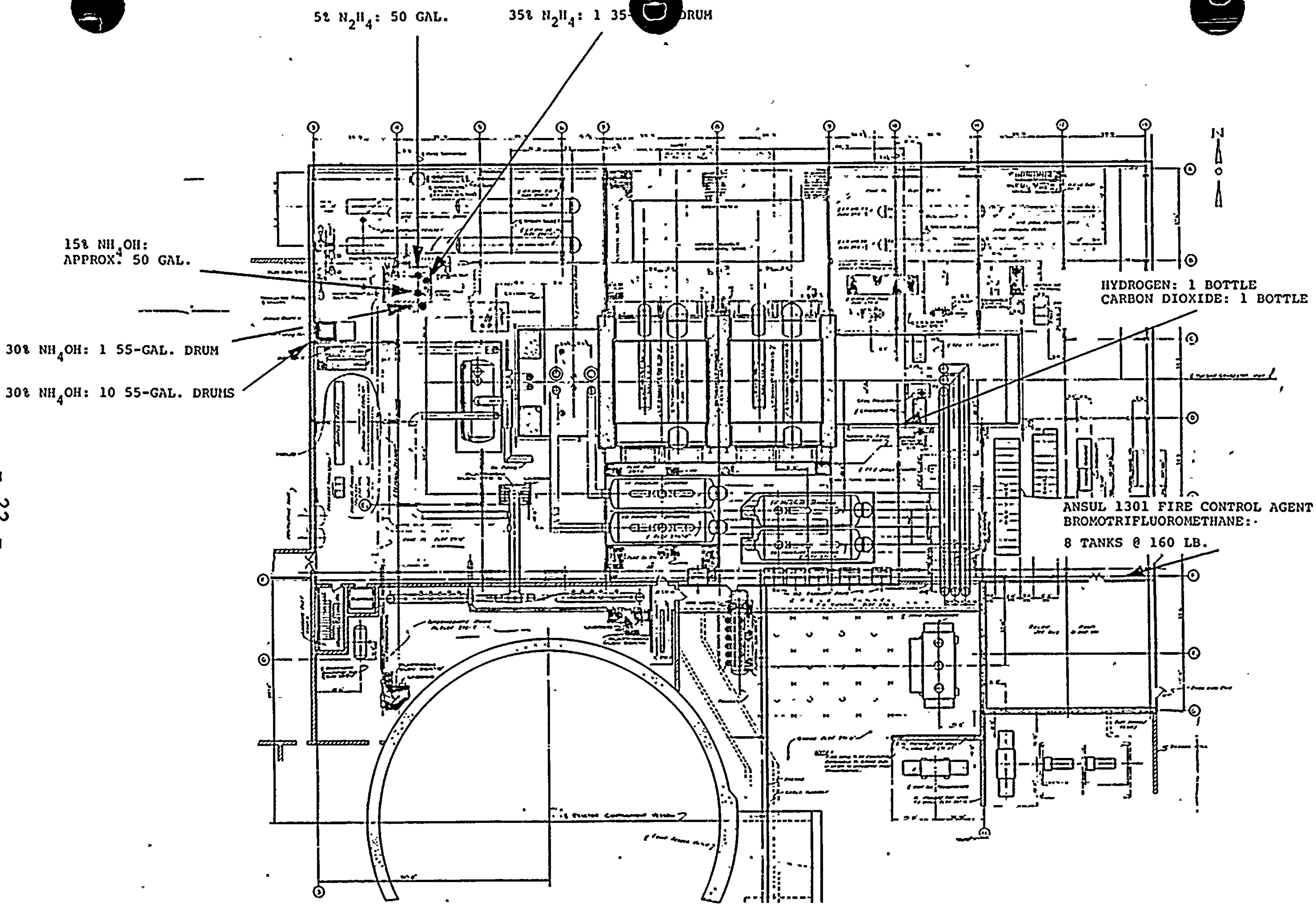
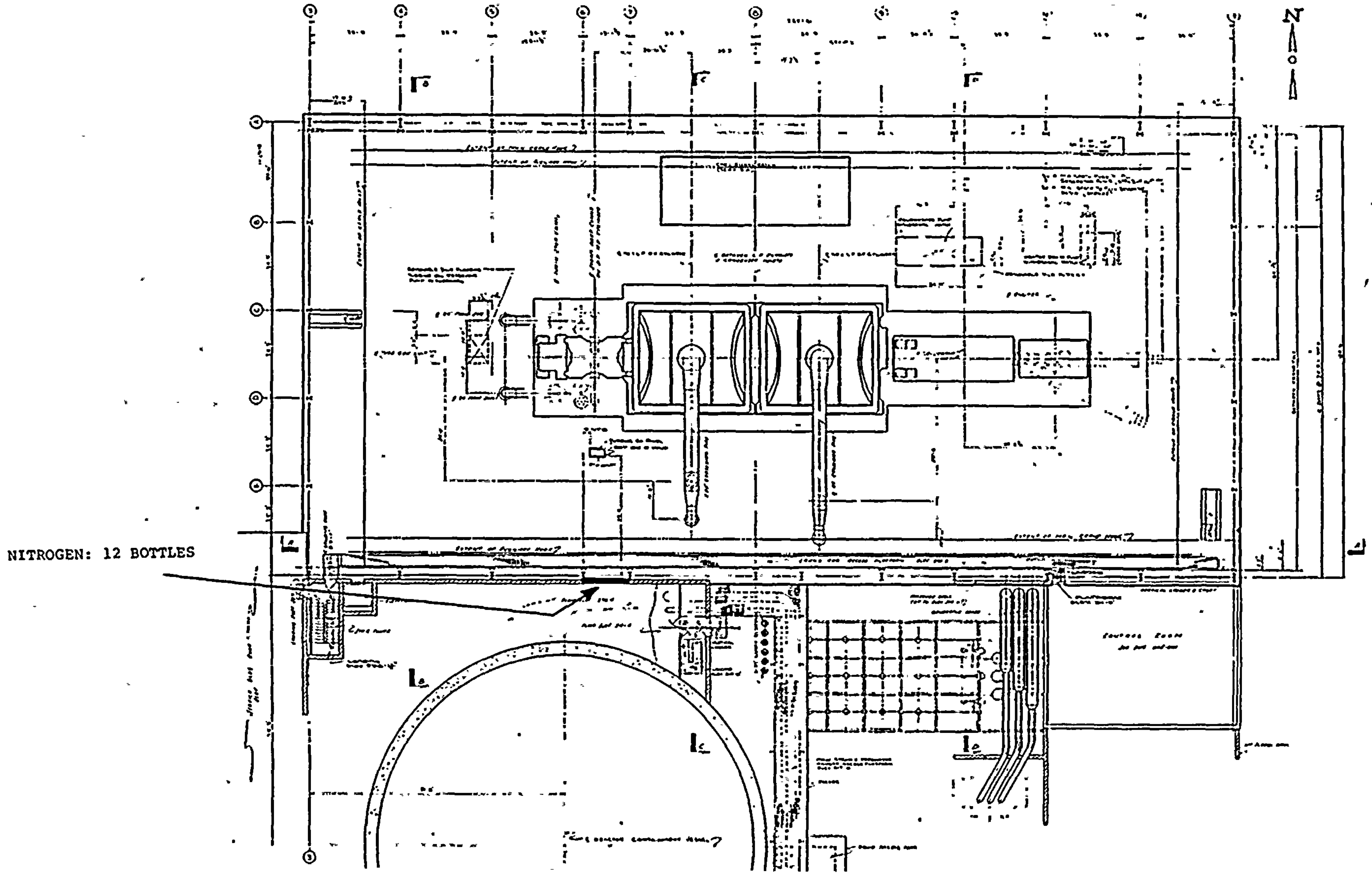


FIG. B-3

TURBINE BUILDING PLAN ABOVE MEZZANINE FLOOR ELEV. 271'-0"



TURBINE BUILDING PLAN ABOVE OPERATING FLOOR ELEV. 289'-6"
FIG. B-4

Appendix C
to Attachment 2

Offsite Toxic Chemical Survey

R. E. Ginna Nuclear Power Plant

Control Room Habitability Study

PROCEDURE FOR DETERMINING TOXIC CHEMICALS WITHIN A FIVE MILE RADIUS OF THE R. E. GINNA NUCLEAR PLANT

A. Objective

The purpose of this survey is to establish type, location and quantity of toxic chemicals at industrial, transportation, or military facilities within a five mile radius of the plant site. In particular, we are interested in those that interfere with the operator's ability to carry out their duties if they were released into the atmosphere. RG&E may also find it worthwhile to look for explosives as part of this survey.

B. Toxic Chemicals

The large number of chemicals which could pose a threat to the operators makes it impossible to conveniently list all of them. Furthermore, determining the minimum quantity of a toxic chemical that has to be evaluated depends on the location and the particular chemical. For most chemicals potentially hazardous quantities range from 100 pounds at distances of less than one mile to 60,000 pounds at four miles. However, for some highly toxic chemicals such as fluorine, quantities may be as low as 8 and 4,800 pounds respectively.

Important quantities of toxic chemicals would cause severe health hazards local to any accident involving them. Therefore, government authorities and the users will be aware of the location of these chemicals. (However, it may be difficult to find the particular person or agency who knows.) Any chemical, held in large enough quantity so that evacuation of the accident site would be required, is of interest to the survey.

Attachment A lists some chemicals that the NRC has found to be important.

C. Methodology

Completing this survey will require some detective work to identify potential users or carriers of toxic chemicals and some persistence to obtain the desired information. These steps should be followed during the survey:

1) Using maps such as those available from the U.S. Geological Survey (USGS), identify the major transportation routes within five miles of the plant. For Ginna, this would include Route 104, the railroad spur that runs parallel to it, and Lake Ontario. Some USGS maps also include the location of major industrial facilities.

2) Contact federal, state, and local agencies responsible for public transportation and safety. First, contact should be by phone to assure that the proper individual is being approached (this will take some effort) and to obtain an agreement to respond. (Remember that these agencies may not be obligated to respond.) Once the correct person (normally the word safety will be in their title) has been contacted, he should be informed of the problem and told that you will be sending him a letter requesting any information that he may have on the subject. To expedite the survey, inquire about any information that he may be able to give over the phone, including other contacts. Records should be kept of all contacts.

3) Based on RG&E's knowledge of the area, contact companies which may store toxic chemicals or transport them within five miles of the site, use the same procedure as in Step 2.

4) Based on these initial contacts, other leads should develop. These should be followed up in the same manner as Step 2 also.

Sample correspondence is contained in Attachment B.
Suggested contacts to make are in Attachment C.

Specifically, the information required about chemicals stored in the area is the number of containers, their size, and their location with respect to the site. The latter should be marked on an appropriate map (USGS). For chemicals in transit, we require the chemical's name, the frequency of shipment (in truckloads, rail cars, or barges per year), and the size of the load.

ATTACHMENT A

Some Toxic Chemicals Important to Past Studies

Acetaldehyde
Acetone
Acrylonitrile
Anhydrous ammonia
Aniline
Benzene
Butadiene
Butenes
Carbon dioxide
Carbon monoxide
Chlorine
Ethyl chloride
Ethyl ether
Ethylene dichloride
Ethylene oxide
Fluorine
Formaldehyde
Helium
Hydrogen cyanide
Hydogen sulphide
Methanol
Nitrogen (compressed or liquified)
Sodium oxide
Sulfur dioxide
Sulfuric acid
Vinyl chloride
Xylene

ATTACHMENT B

Sample Letter

Rochester Gas and Electric has received an inquiry from the Nuclear Regulatory Commission regarding the storage or transport of hazardous materials in the area near the Robert E. Ginna Nuclear Power Plant site. As I mentioned in our phone conversation of __________, we are interested in quantities of hazardous materials within a five mile radius of the Ginna site, which in an accident situation could require an evacuation.

The toxic chemicals of primary concern to us are gases such as chlorine, anhydrous ammonia, and fluorine. Some liquids such as sulfuric acid and xylene can also be of concern.

I have attached a map illustrating the area of concern to us around the Ginna site. Notice that Lake Ontario, Route 104, and a rail spur are all within this area and may carry hazardous chemicals.

The information that we require for toxic chemicals stored near the site is:

- -the chemical's name,
- -the location,
- -the number of containers, and
- -their size.

For chemicals in transit, we require:

- -the chemical's name
- -the frequency of shipment (truckload, rail cars, or barges per year), and
- -the size of the shipments.

If you have any questions or need assistance, please contact _________ at __________. I very much appreciate any attention you can give this request.

ATTACHMENT C

Suggested Contacts

A. U.S. Government

1. U.S. Department of Transportation
   a. Coast Guard
      U.S. Court House and Federal Building, Syracuse, (315) 423-5674
      700 7th Street, SW, Washington, DC 20590 (202) 426-1587
   b. Federal Highway Administration
      Director of Motor Carrier Safety
      W. F. O'Brien Federal Building, Albany (518) 472-7509
      400 7th St., SW, Washington, DC 20590 (202) 426-0648
   c. Federal Railroad Administration
      U.S. Post Office and Court House, Albany (518) 472-2272

2. National Transportation Safety Board
   Bureau of Accident Investigation
   800 Independence Drive, SW
   Washington, DC 20591 (202) 426-8787

B. New York State Government

1. Division of Military and Naval Affairs
   Public Security Building Campus, Albany
   a. Emergency Planning Office (518) 457-2323
   b. Office of Natural Disaster and Civil Defense (518) 457-2222

2. New York Department of Transportation
   a. State Campus Administration and Engineering Building, Albany
      Office of Engineering, Traffic, and Safety Division (518) 457-6438
   b. 1530 Jefferson Road, Rochester 442-8580

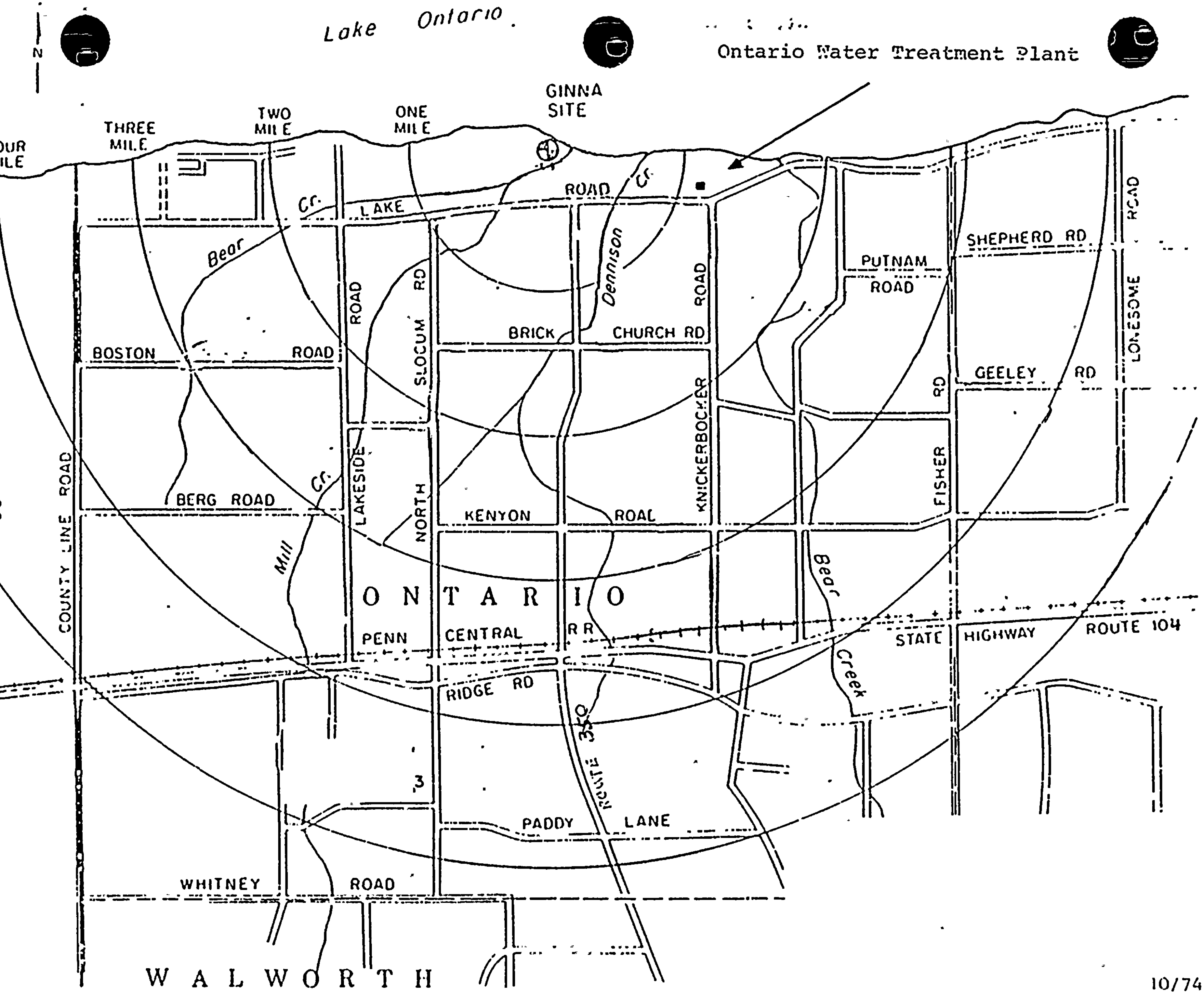
C. Local Government

1. Fire Department
2. Police Department
3. City and County Governments

D. Local Companies

E. Independent Organizations

1. American Trucking Association (for information on local trucking companies)
   1616 P St., NW
   Washington, DC 20036 (202) 797-5241



N
Lake Ontario
Ontario Water Treatment Plant
GINNA SITE
FOUR MILE
THREE MILE
TWO MILE
ONE MILE
LAKE ROAD
Bear Cr.
Dennison Cr.
SHEPHERD RD
ROAD
LONESOME
PUTNAM ROAD
ROAD
SLOCUM RD
BRICK CHURCH RD
ROAD
BOSTON ROAD
GEELEY RD
RD
KNICKERBOCKER
FISHER
COUNTY LINE ROAD
BERG ROAD
Cr.
Mill
LAKESIDE
NORTH
KENYON ROAD
Bear Creek
ONTARIO
PENN CENTRAL RR
STATE HIGHWAY ROUTE 104
RIDGE RD
ROUTE 350
3
PADDY LANE
WHITNEY ROAD
WALWORTH

10/74

TOWN OF ONTARIO

WATER UTILITIES DEPARTMENT
2200 Lake Road
Ontario, New York 14519

JACK C. HAYWOOD
Superintendent
(315) 524-2941

July 31, 1981

Miss June Horning
Rochester Gas & Electric Corp.
89 East Avenue
Rochester, NY 14649

Dear Miss Horning,

In response to your letter of July 23, 1981:

We do store chlorine at the Water Plant site, in two 2,000 lb. tanks. One of them is exchanged for a full tank approximately once a month.

We have no knowledge of the route of the delivery truck, not the total amount of chlorine or other hazardous chemicals it may carry. Our chlorine supplier is Jones Chemicals of Caledonia.

Do not hesitate to contact us for more information if needed.

Sincerely yours,

Michael J. Malcolm
Water Plant Operator

MJM:dhf

JONES CHEMICALS, INC.

ESTABLISHED 1930 MANUFACTURERS ®

Chemical Specialties

100 SUNNY SOL BLVD. • CALEDONIA, NY 14423

Telephone: (716) 538-2311

Sunny Sol Brand®
INDUSTRIAL CHEMICALS

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Jacksonville, Fla.
Merrimack, N.H.
Milford, Virginia
Milpitas, Calif.
Mobile, Alabama
New Orleans, La.
(Reserve, La.)
San Diego, Calif.
St. Petersburg, Fla.
Tacoma, Wash.
Torrance, Calif.
Warwick, N.Y.
Wyandotte, Mich.

August 21, 1981

Rochester Gas & Electric
89 East Ave.
Rochester, NY 14649

Attention: June Horning

Dear Mrs. Horning:

Enclosed is the map showing the routes travelled by JCI trucks in delivering to Ginna Nuclear Power Plant and Ontario Water Treatment Plant. We do not deliver chlorine to the Ginna Plant. We do deliver approximately 1 ton container of chlorine per month to Ontario Water Treatment Plant. The truck might have a total of 6 to 8 tons chlorine maximum on board.

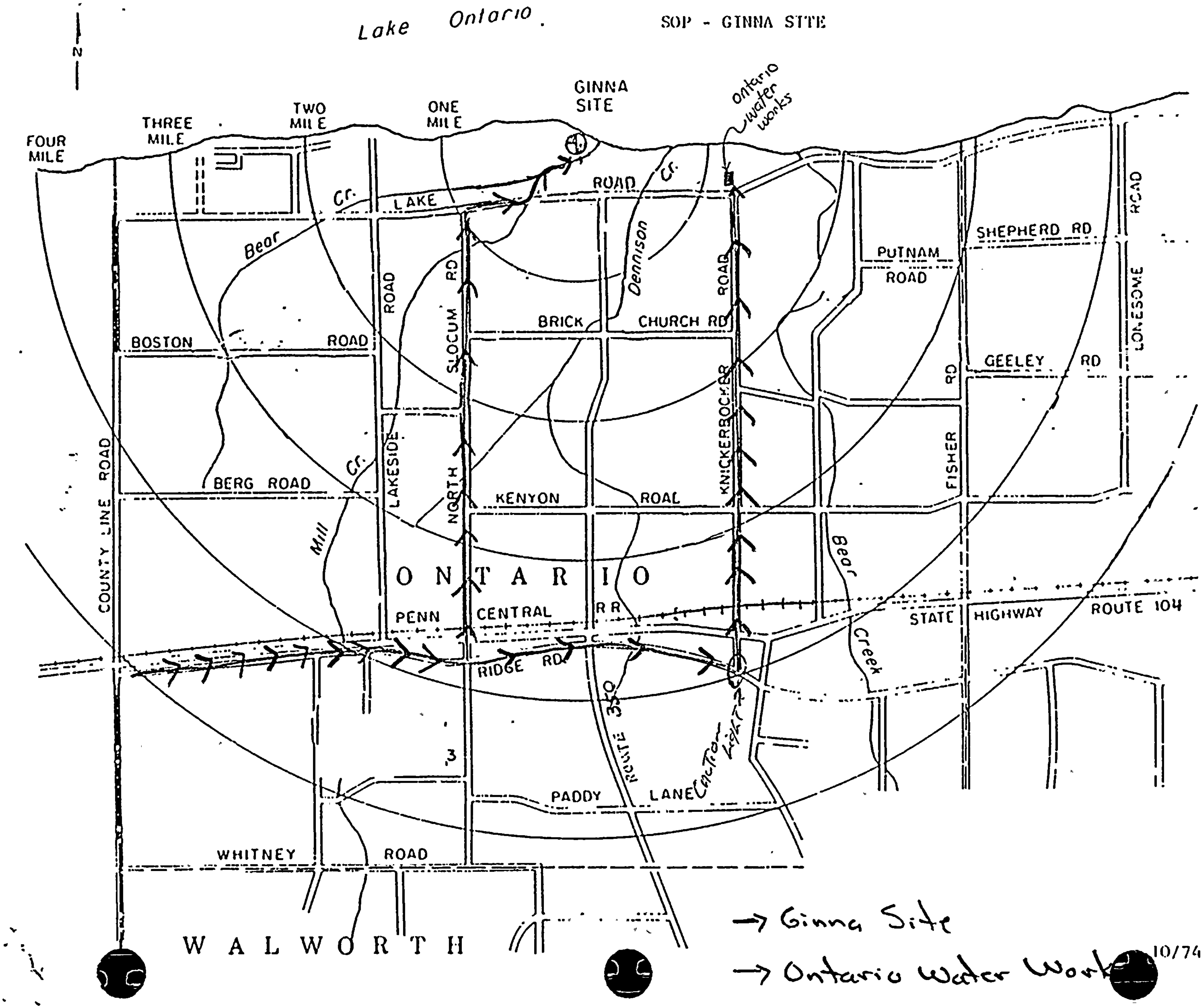
I trust this is the information you require.

Sincerely,

JONES CHEMICALS, INC.

J. H. Sullivan
National Safety Director

JHS/lmb


Lake Ontario.
N
GINNA SITE
Ontario water works
FOUR MILE
THREE MILE
TWO MILE
ONE MILE
LAKE ROAD
Bear Cr.
Dennison Cr.
SHEPHERD RD
PUTNAM ROAD
LONESOME ROAD
BRICK CHURCH RD
BOSTON ROAD
SLOCUM RD
LAKESIDE ROAD
KNICKERBOCKER ROAD
GEELEY RD
FISHER RD
COUNTY LINE ROAD
BERG ROAD
Mill Cr.
NORTH
KENYON ROAL
Bear Creek
ONTARIO
PENN CENTRAL RR
STATE HIGHWAY ROUTE 104
RIDGE RD
ROUTE 350
3
Caution light
PADDY LANE
WHITNEY ROAD
WALWORTH
→ Ginna Site
→ Ontario Water Works

10/74

Hazardous Chemical Survey
Town of Ontario Water Utilities: Chlorine
July 2, 1981

Town of Ontario Water Utilities Dept.
2200 Lake Road
Ontario, New York 14519

Jack C. Haywood, Superintendent
Mike Ralston, Operator (524-2941)
Mike Malcomb, Operator (524-8520)

The town of Ontario operates two water treatment facilities:

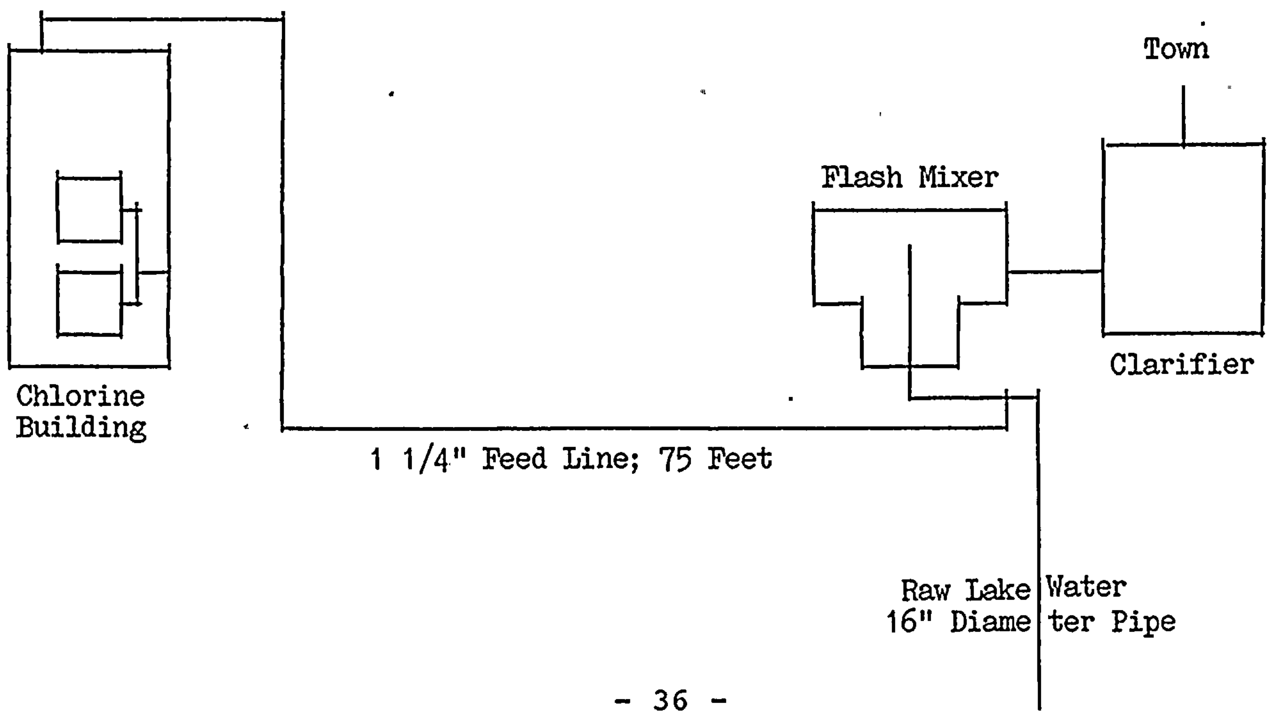
A. Wastewater treatment plant and a lake water treatment plant. The former is locatd on Lake Road, 1.5 miles east of Ginna, the later is 1 mile east on Lake Road also. Both store pressurized tanks of chlorine on site.

The lake water treatment plant stores chlorine in two 2000 lb. cylinders housed in a separate chlorine building. These tanks are side by side, individually connected to the main system via an aluminum tube with an outer diameter of approximately 1/2 inch. Only one tank is in use at any time: the other is shut off with a valve at the tank mouth.

From the 1/2 inch feedline, the chlorine is dissolved into a 1 1/4 inch water line (outside diameter) which leads to the main building; it is a distance of 75 feet. Chlorine, polymers and alum are added to the raw lake water in the main building. It then enters a flash mixer and charifier. The entire system is computerized with self adjusting automatic feed.

Chlorine is used at an average rate of 70 lbs/day with one of the cylinders kept in reserve, and the other refilled monthly.

<u>LAKE WATER TREATMENT PLANT FLOW CHART:</u>

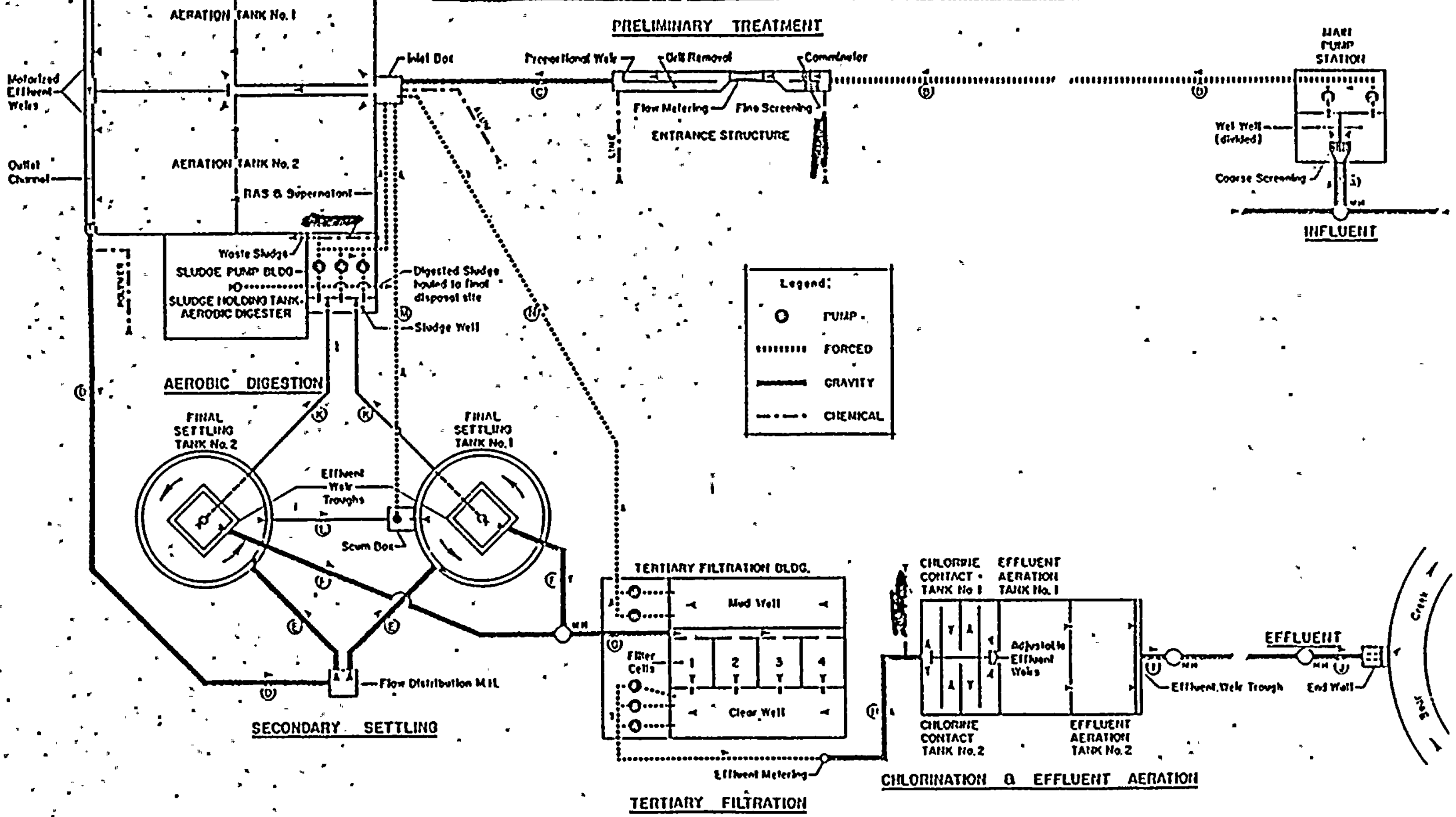


Information on the Lake Water Treatment Plant was obtained from Ron Reyse, a temporary operator while Mike Malcomb is on vaction. Further questions should be directed toward Mr. Malcomb after 7/7/81.

The wastewater treatment facility stores chlorine in 150 lb cylinders, housed in a chlorine room which is part of the administrative building and laboratory. Five to six full tanks are delivered monthly. Two of these tanks are hooked up to the system at the same time, one is shut off at the tank water. From the chlorine room, the chlorine travels approximately 300 feet through underground piping to the retention tank. Here the chlorine is bubbled into the wastewater. Underground piping for chlorine also leads to the entrance structure and the aerobic digestor, but it is not currently used.

This information was obtained from Mike Ralston, Operator. Questions should be directed toward Jack Haywood, Superintendent.

TOWN OF ONTARIO WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT FACILITIES
Schematic Flow Diagram



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
Commanding Officer
USCG MARINE SAFETY OFFICE
Federal Bldg., Rm 1111
111 West Huron Street
Buffalo, New York 14202

16450
24 July 1981

Ms. June Horning
Rochester Gas & Electric Corp.
89 East Avenue
Rochester, NY 14649

Dear Ms. Horning:

In response to your letter of 21 July 1981, this office does not maintain records of the information you requested.

Sincerely

THERON A. PATRICK
Lieutenant Commander
U. S. Coast Guard
By direction of the
Commanding Officer

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
Officer In Charge
Coast Guard Station
Sodus Point ,NY 14555

13 August 1981

Rochester Gas And Electric
89 East Avenue
Rochester, NY 14649

Dear Miss Horning

After being in contact with my command I've found that we have no records of any disposal or waste sites in the area.

I apologize for the time delay but summer schedules are quite busy. If I may be of further assistance please contact my office.

Sincerely

M.G. PARKER
BM1 U.S. COAST GUARD
Officer In Charge

POST-*kwik* PK100R-3 REPLY MESSAGE

FORM NO. PK100R-3
AVAILABLE FROM
BUSINESS ENVELOPE MANUFACTURERS, INC.
PEARL RIVER, N.Y. • BRONX, N.Y. • CLINTON, TENN.
MELROSE PARK, ILL. • ANAHEIM, CALIF.

TO

June Horning
Rochester Gas & Electric Corporation
89 East Avenue
Rochester, New York 14649

BARKER CHEMICAL CORPORATION
P. O. BOX 156
ALTON, NEW YORK 14413

SUBJECT:

DATE: July 29, 1981

FOLD

In regards to the attached letter which we received from you, we do not handle any chemicals which would fit into the discriptions you gave. What we do handle is low-grade agricultural chemicals (non toxic) If I can be of more assistance, please feel free to contact me at the above address.

PLEASE REPLY TO

SIGNED: William R. Shay

DATE:

SIGNED:

FORM NO. PK100R-3
AVAILABLE FROM BUSINESS ENVELOPE MANUFACTURERS, INC. • PEARL RIVER, N.Y. • BRONX, N.Y. • CLINTON, TENN. • MELROSE PARK, ILL. • ANAHEIM, CALIF.

LOT # 574566

Xerox Corporation
Joseph C. Wilson Center for Technology
Rochester, New York 14644

XEROX

July 29, 1981

Ms. June Horning
Rochester Gas & Electric Corporation
89 East Avenue
Rochester, NY 14649

Dear Ms. Horning:

This memo is in response to your request for information on Xerox storage or transportation of hazardous chemicals within a five mile radius of Ginna Nuclear Power Plant.

Please be advised that Xerox does not currently store or transport hazardous chemicals within the specified five mile radius.

If you require any additional information on this subject, please do not hesitate to contact me.

Yours truly,

James F. O'Brien

James F. O'Brien
Manager, Operations Safety
Corporate Environmental Health and Safety

dc

c: J. MacKenzie

AGCHEM SERVICE CORP.

P.O. BOX 7
SODUS, NEW YORK - 14551

AREA CODE 315-483-9146

July 29, 1981

Ms. June Horning
Rochester Gas & Electric Corp.
89 East Avenue
Rochester, New York 14649

Dear Ms. Horning:

In response to your letter of July 21, 1981 I will try to help you, as much as I am able to.

Fruit growers in the area store small quantities of agricultural chemicals for short periods of time. Economic conditions necessitate accurate planning and purchasing of agricultural chemicals thereby eliminating any inventories of hazardous chemicals on the farm. Most farmers today buy only what they need for an individual spray application and it is normally used within a day or two of purchase.

These materials would be stored in a properly constructed and placarded building used specifically for spray materials.

The names of these chemicals are:

Guthion (Azinphos Methyl)	12/2½#/case
Vydate L (Oxyaml)	1 gal. & 5 gal. cans
Lannate (Methomyl)	1 gal. & 5 gal. cans
Monitor (Methamidophos)	2 gal. & 5 gal. cans
Parathion	5 gal. cans
Furadan (Carbofuran)	50# bags & 1 gal. container
Temik (Aldicarb)	30# bags
Systox (Demeton)	2 gal. cans

Quantities would be next to impossible to estimate.

Chemicals in transit would be primarily for delivery to local distribution firms. I would estimate that not over 50 truckloads of hazardous agricultural chemicals would pass on the designated highways per year. The list would be the same as the above list.

There would be several hundred shipments of less than

AGCHEM

truck load quantities of these materials for delivery to farms and local distributors ranging in size from 1 gallon to several pallets.

I trust this is the information you require and I regret that I cannot supply you with more accurate quantities.

Yours truly,

AGCHEM SERVICE CORPORATION

William R. Handrich, Jr.
General Manager

WRH:sd

ROCHESTER GAS AND ELECTRIC CORPORATION

INTEROFFICE CORRESPONDENCE

August 18, 1981

SUBJECT: Visit to Ontario Agway Store, August 18, 1981 - Toxic Chemical Survey

TO: File

Today I met with Mr. Roy Hermann, owner of the Ontario Agway store located approximately 3.7 miles southeast of Ginna Station, near the corner of Furnace Road and Route 104.

I was shown the following materials found on the premises:

Item	Approx. Quantity
Various pesticides (Parathion, Guthion, Vidate, Nudrin, Paraquat, Disyston)	1-2 cases
Shrub sprays (containing 50% xylene or aromatic petroleum deriv. solvent)	less than 3 gal.
Liquid chlorine for swimming pools	30-40 4-gallon cases
NITAN (32% nitrogen in solution; of which 50% urea, 50% ammonium nitrate).	4,000 gal.

These inventories were considered typical of those quantities in stock for this season of the year.

Richard J. Watts

Richard J. Watts