COMMONWEALTH of VIRGINIA
Department of Health
DONALD R. STERN, M.D., M.P.H.
ACTING STATE HEALTH COMMISSIONER
P. O BOX 2448
RICHMOND, VA 23218

June 8, 1995

MEMORANDUM **GMP #70**

TO: District Directors
Environmental Health Managers
Environmental Health Supervisors
Office of Environmental Health Staff
Office of Water Programs

FROM: Donald J. Alexander, Director Donald J. Alexander
Division of Onsite Sewage and Water Services

SUBJECT: Preliminary Approval of Sewage Discharge Systems
Sewage - Discharge - Approval

Aquarobic USA has requested preliminary approval of the "AQUAROBIC: THE VIRGINIA 600 MINI-PLANT/FILTER". Based on a technical review of the design and engineering principles conducted by the Division in accordance with §2.25 B of the Alternative Discharging Regulations and the recommendations of the Discharge Regulations Task Force's Technical Committee, the Division of Onsite Sewage and Water Services grants **preliminary approval** as indicated in paragraph 1) and 3) of the attached letter. The approval becomes effective the date of this memorandum

GMP #70
Sewage - Discharge - Approval

COMMONWEALTH of VIRGINIA

Department of Health

DONALD R. STERN, M.D., M.P.H.
ACTING STATE HEALTH COMMISSIONER

P. O. BOX 2448
RICHMOND, VA 23218

June 8, 1995

Daniel E. Pavón, President
AQUAROBIC International, Inc.
999A Shenandoah Shores Road
Front Royal, Virginia 22630

Dear Mr. Pavón:

Re: Request for preliminary approvals of "AQUAROBIC: THE VIRGINIA 600 MINI-PLANT/FILTER" under the Alternative Discharging Sewage Treatment Regulations for Single Family Dwellings (DSTR).

The Division of Onsite Sewage and Water Services has reviewed your request for preliminary approval of the Virginia 600 Mini-Plant as referenced in our letter to you dated March 15, 1995. Based on our review we find the following:

1) Preliminary approval is granted to the Virginia 600 Mini-Plant/Filter (mini-plant), as shown in attachment 1, for discharges to dry ditch or intermittent streams of 500' or more (IS/DD 500) for design flows up to 600 gpd. This sewage treatment system consists of a 6' wide by 11' long by 4' deep aerobic batch activated sludge compartment which receives the waste directly from the house connection. Clarified wastewater from the aeration chamber is then pumped to a 3' wide by 6' long by 3.6' deep up flow gravel filter. The gravel in the filter will have an effective size of less than 3.5 mm and a uniformity coefficient of less than 4.0. Virginia Department of Transportation's 78, 8 or 9 gravel should meet the effective size and uniformity coefficient. A pump is provided to return the liquid and any solids that accumulated in the filter back to the aeration chamber. Wastewater from the up flow filter passes through a tablet chlorinator and then enters the chlorine contact tank. The chlorine contact tank has an approximate volume of 600 gallons. Chlorinated wastewater then passes through a tablet dechlorinator. If ultraviolet light disinfection is used then the flow from the upflow filter must be limited to the capacity for the ultraviolet unit.

2) Preliminary approval is denied for the unit described above for use in discharges to dry ditches or intermittent streams 250'-499' (IS/DD 250) in length. Based on your request the unit described above is not equivalent to the combination process (or redundant units) required in Table 3.2 of the Discharge Regulations. We do not think the upflow unit by itself (without the aeration unit) would be able to provide an effluent of 30 mg/L BOD_5 and 30 mg/L total Suspended solids.

3) Preliminary approval is granted to the Virginia 600 mini-plant/filter, as described in 1) above, with a constructed wetlands for discharges to IS/DD 250. This system is shown in attachment 2. The wetlands must be a minimum of 100 ft^2. The components of the wetlands may be adjusted as new developments in wetlands treatment technologies progresses.

4) Preliminary approval is denied for the Virginia 600 mini-plant/filter when followed by a downflow sandfilter for discharges to IS/DD 250 as shown on pages 7 and 8 as attached to our letter dated March 15, 1995. This system has not been installed or tested to see if it will mechanically function as designed. If a bench scale or field experimental operation indicates the system will function as well as the system described in paragraph C and D of GMP #18, we may reevaluate your request.

Construction plans and specifications prepared by an engineer licensed in the Commonwealth of Virginia must be submitted, for the systems granted preliminary approval, and be in accordance with § 2.14 of DSTR. As appropriate all pumps must have either high water or failure to pump alarms. All chlorination and dechlorination tubes should be designed so that when the tubes are removed the tablets remain in the tube for inspection. Post aeration will need to be provided.

If you have any questions or comments on the above, please contact me at (804) 786-1750.

Sincerely,

Roger A. Cooley
Assistant Technical Services Chief
Division of Onsite Sewage and Water Services

pc: Don Alexander
Cal Sawyer, PE

STATE DEPARTMENT OF HEALTH

Richmond, Virginia

Inter-Office Correspondence

June 20, 1995

MEMORANDUM

TO: District Directors
Environmental Health Managers
Environmental Health Supervisors
Office of Environmental Health Staff
Office of Water Programs

FROM: Roger A. Cooley, Asst. Technical Services Chief
Division of Onsite Sewage and Water Services

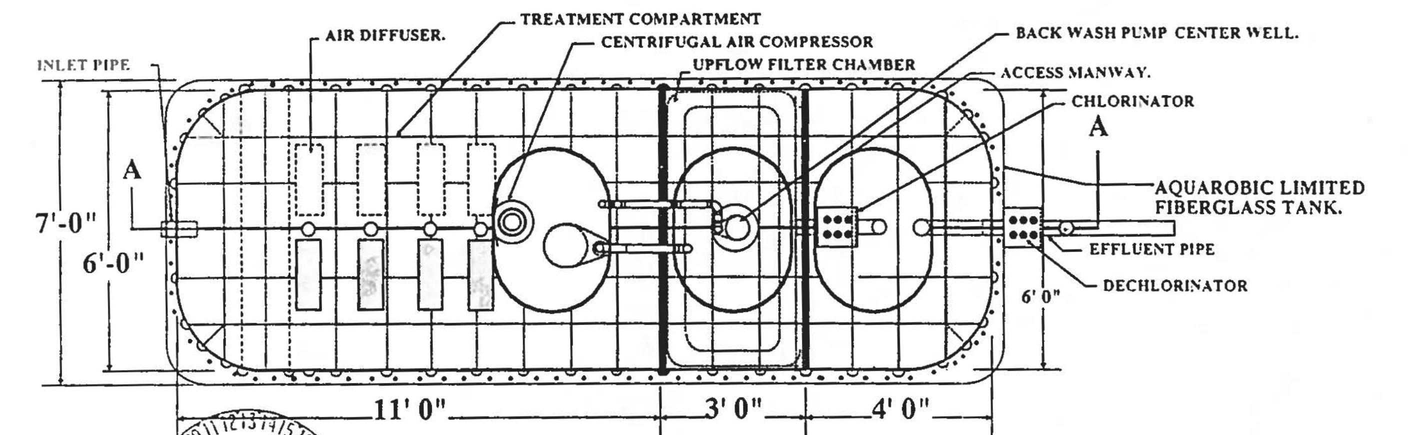
SUBJECT: GMP #70

Please attach the following drawings to GMP #70. These drawings may not have been mailed out with the GMP #70. I am Sorry for any inconvenience.

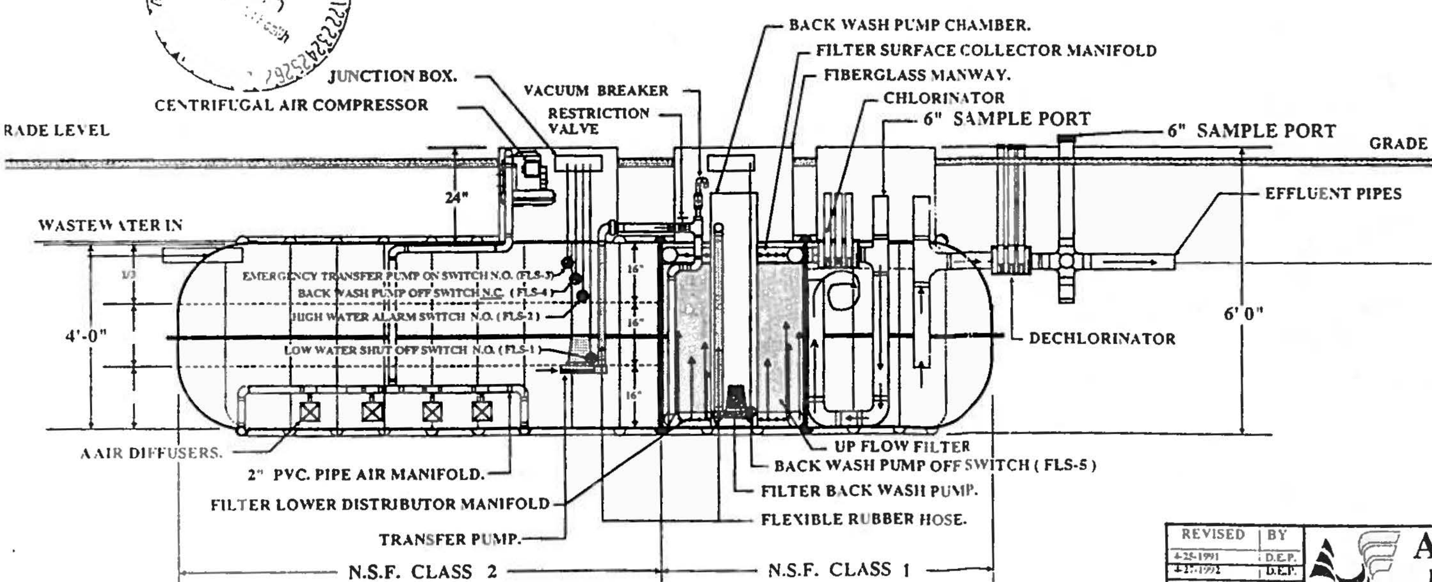
Attachments

VDH
Virginia Department of Health

ATTACHMENT 1



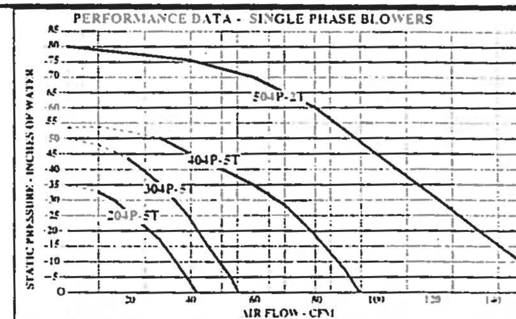
PLAN VIEW

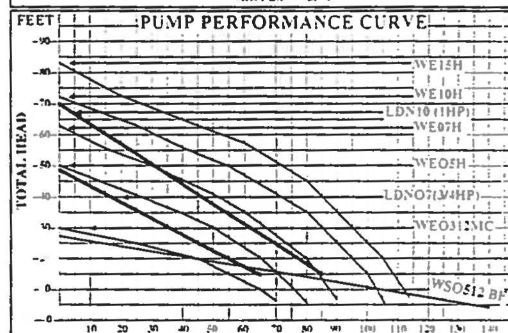


SECTION A - A

CONCEPT HEREIN DISCLOSED IS PROPRIETORY WITH AQUAROBIC LIMITED
) MAY NOT BE REPRODUCED OR USED WITHOUT PRIOR WRITTEN AUTHORIZATION.

- 1 SWITCH = LOW WATER PUMP SHUT OFF (NORMALLY OPEN)
- 2 SWITCH = HIGH WATER ALARM (NORMALLY OPEN)
- 3 SWITCH = EMERGENCY TRANSFER PUMP ON. (NORMALLY OPEN)
- 4 SWITCH = PREVENTS FILTER BACK-WASH PUMP FROM RUNNING DURING EMERGENCY PUMPING. (NORMALLY CLOSED)





N.S.F. INT. CLASS # 1
AQUAROBIC CLASS # 1A
WITH FILTER # 3,000

REMOVAL EFFICIENCIES
BASED ON AVERAGE OF VALUES
9 DEC 1990 -- 4 JULY 1990

	INFLUENT AVERAGE	EFFLUENT AVERAGE	REDUCTION	PERCENT REDUCTION
BIOCHEMICAL OXYGEN DEMAND MG/L	150	5	145	96.6 %
SUSPENDED SOLIDS MG/L	180	5	175	97.2 %

REVISED	BY
4-25-1991	D.E.P.
4-27-1992	D.E.P.
6-15-1992	D.E.P.
3-11-1995	D.E.P.

AQUAROBIC ®
INTERNATIONAL INC.
999A SHENANDOAH SHORES RD.
FRONT ROYAL, VIRGINIA U.S.A 22630
PHONE: (703) 635-5200 / FAX: (703) 635-2277

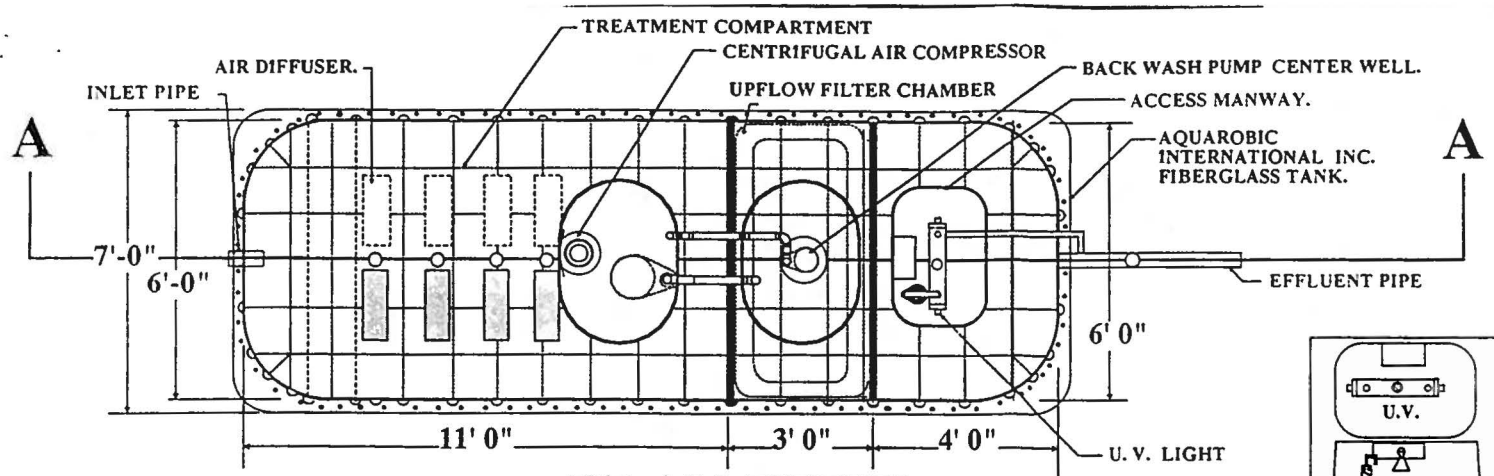
1

SCALE: N.T.S.

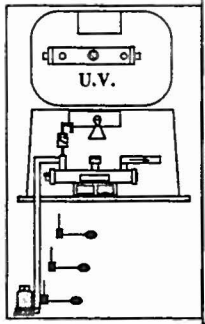
THE VIRGINIA 600 MINI-PLANT / FILTER AND DISINFECTION IN FIBERGLASS TANK

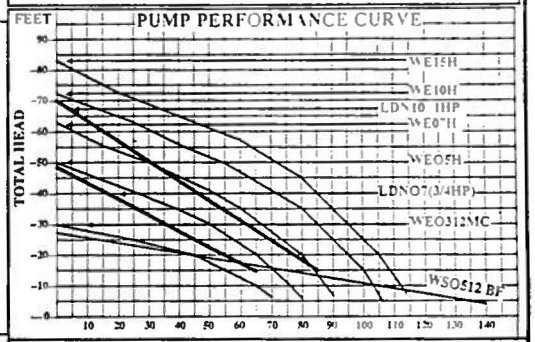
DRAWING NO: V-600-230 VOLTS

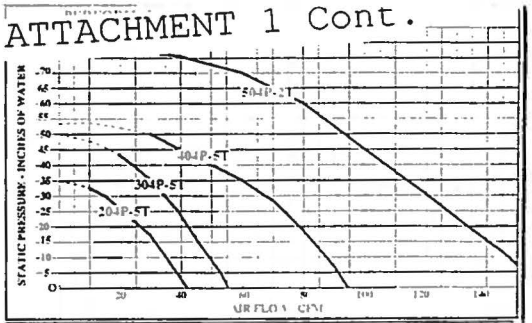
ATTACHMENT 1 Cont.

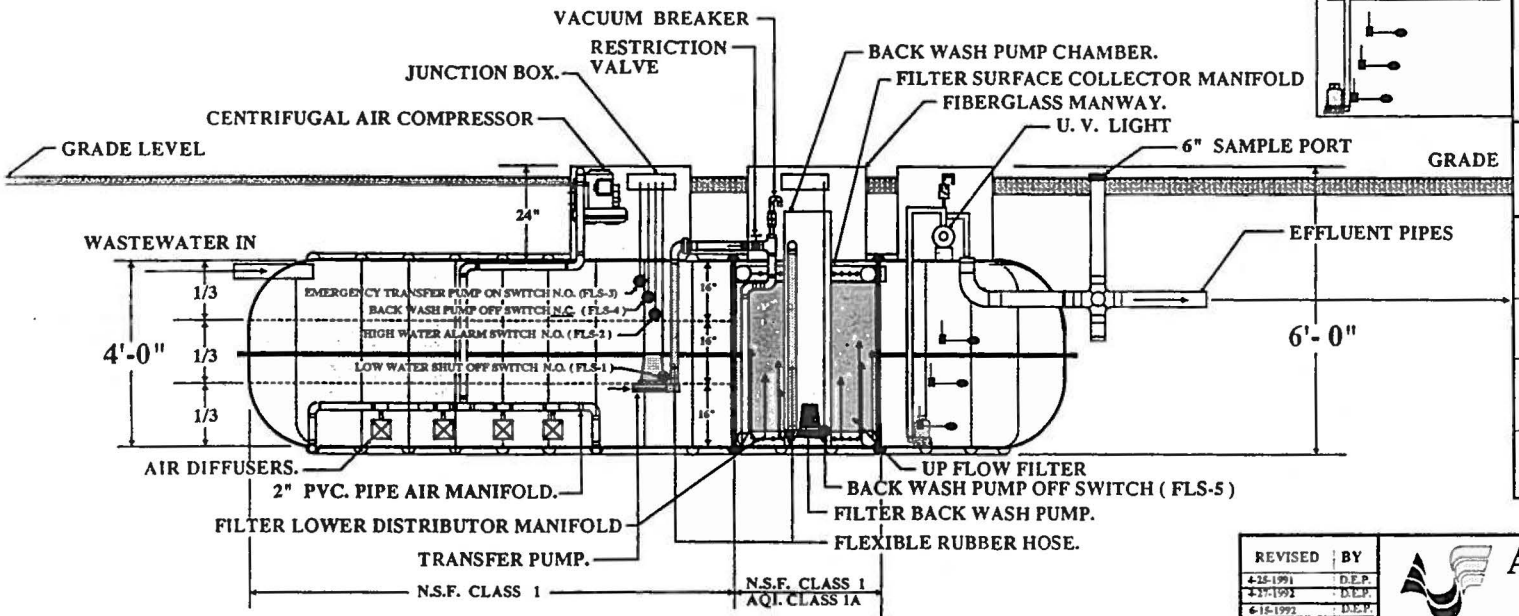


PLAN VIEW









SECTION A - A

N.S.F. INT. CLASS # 1
AQUAROBIC CLASS # 1A
WITH FILTER # 3,000

REMOVAL EFFICIENCIES
BASED ON AVERAGE OF VALUES
9 DEC 1990 -- 4 JULY 1990

	INFLUENT AVERAGE	EFFLUENT AVERAGE	REDUCTION	PERCENT REDUCTION
BIOCHEMICAL OXYGEN DEMAND MG/L	150	5	145	96.6 %
SUSPENDED SOLIDS MG/L	180	5	175	97.2 %

NOTES:

1. THE CONCEPT HEREIN DISCLOSED IS PROPRIETORY WITH AQUAROBIC INTERNATIONAL INC. AND MAY NOT BE REPRODUCED OR USED WITHOUT PRIOR WRITTEN AUTHORIZATION.
2. FLS-1 SWITCH = LOW WATER PUMP SHUT OFF (NORMALLY OPEN)
3. FLS-2 SWITCH = HIGH WATER ALARM (NORMALLY OPEN)
4. FLS-3 SWITCH = EMERGENCY TRANSFER PUMP ON. (NORMALLY OPEN)
5. FLS-4 SWITCH = PREVENTS FILTER BACK-WASH PUMP FROM RUNNING DURING EMERGENCY PUMPING. (NORMALLY CLOSED)

REVISED	BY
4-25-1991	D.E.P.
4-25-1992	D.E.P.
6-15-1992	D.E.P.
3-11-1995	D.E.P.

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2

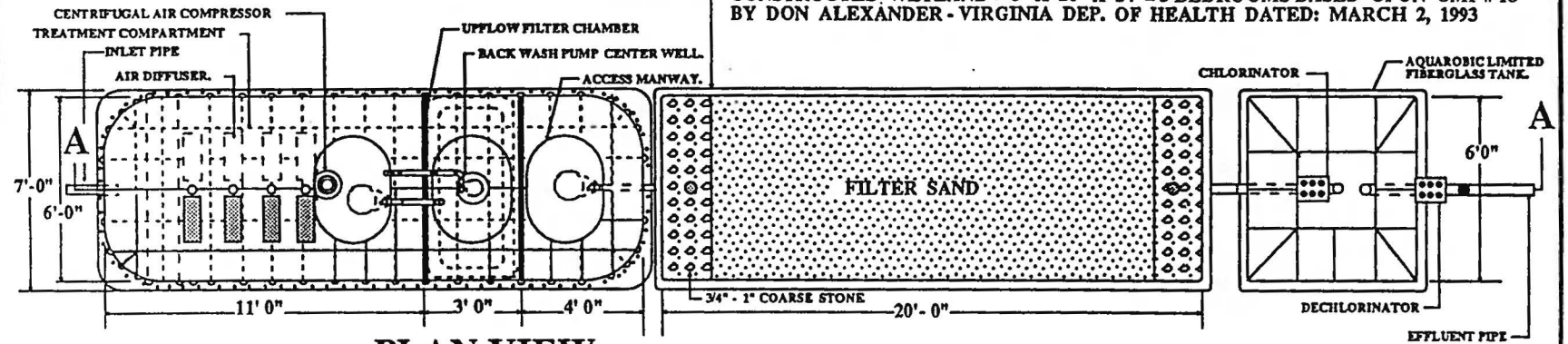
SCALE: N.T.S. MODEL #: FB4291-4-S- ~230 V BY: D.E.PAVON

THE VIRGINIA 600 MINI-PLANT / FILTER AND DISINFECTION IN FIBERGLASS TANK

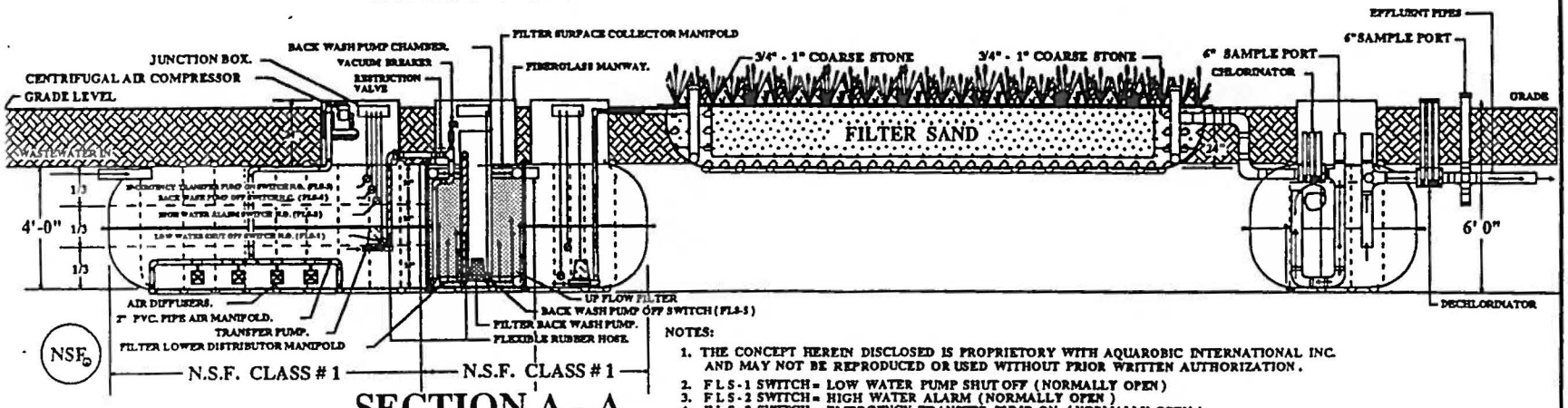
DRAWING NO: V-600-230 VOLTS DATE : 6/15/1992

ATTACHMENT 2

CONSTRUCTED WETLAND = 6' X 20' X 24"= 5 BEDROOMS BASED UPON GMP # 18
BY DON ALEXANDER - VIRGINIA DEP. OF HEALTH DATED: MARCH 2, 1993



PLAN VIEW



SECTION A - A

NOTES:

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2. F.L.S.-1 SWITCH = LOW WATER PUMP SHUT OFF (NORMALLY OPEN)
3. F.L.S.-2 SWITCH = HIGH WATER ALARM (NORMALLY OPEN)
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5. F.L.S.-4 SWITCH = PREVENTS FILTER BACK-WASH PUMP FROM RUNNING DURING EMERGENCY PUMPING. (NORMALLY CLOSED)

N.S.F. INT. CLASS # 1 WITHOUT FILTER # 3,000

REMOVAL EFFICIENCIES BASED ON AVERAGE OF VALUES 11 APRIL 1993 -- 28 OCTOBER 1993

	INFLUENT MEDIAN	EFFLUENT MEDIAN	REDUCTION	PERCENT REDUCTION
BIOCHEMICAL OXYGEN DEMAND MG/L	170	7	163	95.8%
SUSPENDED SOLIDS MG/L	200	11	189	94.5%

N.S.F. INT. CLASS # 1 AQUAROBIC CLASS # 1 A WITH FILTER # 3,000

REMOVAL EFFICIENCIES BASED ON AVERAGE OF VALUES 9 DEC 1990 -- 4 JULY 1990

	INFLUENT MEDIAN	EFFLUENT MEDIAN	REDUCTION	PERCENT REDUCTION
BIOCHEMICAL OXYGEN DEMAND MG/L	150	5	145	96.6%
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AQUAROBIC®
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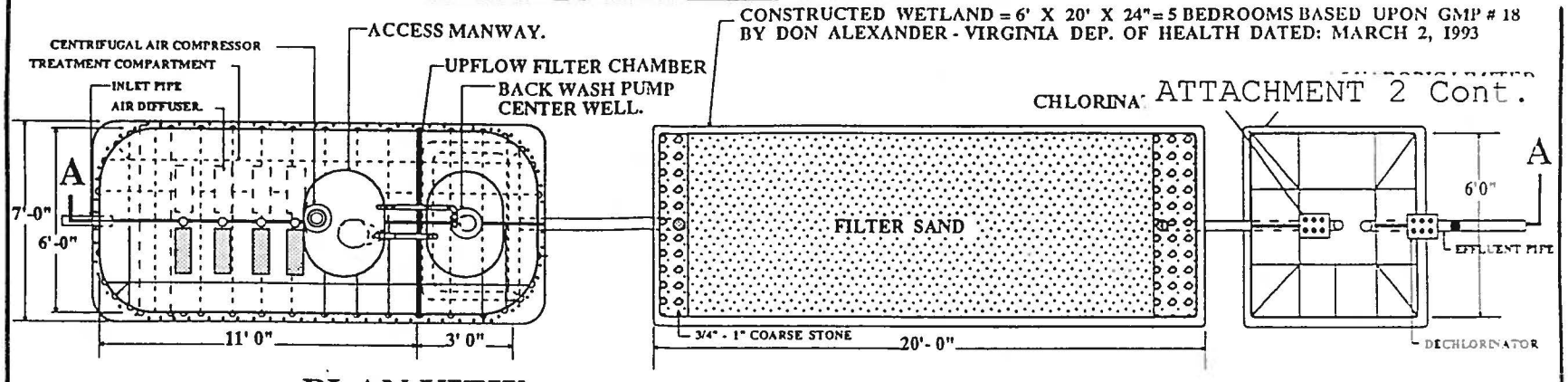
SCALE: N.T.S. MODEL #: F54291-7.5- [illegible] -230 V BY: D.E.PAYON

THE MINI-PLANT # F54291-7.5 - 750 GAL/DAY FILTER UNIT DISCHARGING TO A CONSTRUCTED WETLAND WITH DISINFECTION IN FIBERGLASS TANKS FOR PARCEL 12A, FOREST HILLS ESTATES, PRINCE WILLIAM COUNTY, VIRGINIA.

DRAWING NO: V-750-230 VOLTS DATE : 2/7/1994

6



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N.S.F. INT. CLASS # 1
WITHOUT FILTER # 3,000

REMOVAL EFFICIENCIES
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AQUAROBIC CLASS # 1 A
WITH FILTER # 3,000

REMOVAL EFFICIENCIES
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SUSPENDED SOLIDS MG/L	180	5	175	97.2%

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5

SCALE: N.T.S. MODEL #: F54291-7.5-E- @ 230 V BY: D.E.PAYON

THE MINI-PLANT MODEL # F54291-7.5
750 GAL/DAY FILTER UNIT DISCHARGING TO A CONSTRUCTED WETLAND WITH DISINFECTION IN FIBERGLASS TANKS

DRAWING NO: 2-V-750-230 VOLTS DATE: 10/26/1994