Entergy

Entergy Nuclear Northeast
Entergy Nuclear Operations, Inc.
Vermont Yankee
322 Governor Hunt Rd.
P.O. Box 157
Vernon, VT 05354
Tel 802-257-7711

July 6, 2005

John Akielaszek
Indirect Discharge Permit Section
Wastewater Management Division
Vermont Agency of Natural Resources
Department of Environmental Conservation
103 South Main Street- Sewing Building
Waterbury, VT 05671-0405

Dear John,

Enclosed is Entergy Nuclear Vermont Yankee's Indirect Discharge Permit (IDP) renewal application. As required, the following attachments are included in support of the IDP renewal:

Attachment 1 – Completed WR-82 application form

Attachment 2 – 2005 Annual inspection of wastewater disposal systems

Attachment 3 – Evaluation of effluent and groundwater monitoring data between 2000 and 2004

Attachment 4 – Demonstration of compliance with aquatic biota criteria

Attachment 5 – Condition by condition review of permit, establishing compliance with all permit conditions

Attachment 6 – Application fee

Please do not hesitate to call if you require additional information or clarification relative to the information included herein.

Sincerely,
Entergy Nuclear Vermont Yankee, LLC

Lynn DeWald
Environmental Specialist

Samuel A. Wender IV
Chemistry Superintendent

ATTACHMENT 1

WR-82 application form

STATE OF VERMONT
AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WASTEWATER MANAGEMENT DIVISION
10 V.S.A. Chapter 47 Permit Application Form WR-82

Application For: (Check (☐) one)	with Schedule:	Action Requested: (Check (☐) one)
☒ Municipal/Industrial Discharge Permit	A or B	☐ Original Permit
☐ Emergency Pollution Permit	E	☒ Renewal *
☐ Indirect Discharge Permit	I	☐ Amendment *
☐ Pretreatment Discharge Permit	B	☐ Transfer *
☐ Underground Injection Control Permit	Special Form	* Permit # 9-0036
Status of Discharge: (Check (☐) one)		**Nature of Waste:** (Check (☐) one)
☐ Proposed		☒ Sanitary (domestic sewage only)
☒ Existing		☐ Non-Sewage/Industrial
		☐ Stormwater (surface or subsurface disposal)

For DEC Use: PIN _____ Reviewer: JJA Check #: _____ Title 3: Y N

1. Applicant: Entergy Nuclear Vermont Yankee

   Legal Entity: Limited Liability Company
   (Individual, corporation, partnership, firm, state agency, municipality, etc.)

2. Mailing Address: 320 Governor Hunt Road Vernon, VT 05654

3. Contact Lynn DeWald
   Telephone: 802-258-55 Fax: 802-258-58

4. Name of Activity: Vermont Yankee Nuclear Power Station
   (John Doe residence, SYZ Corp., Clark Lake State Park, Green Motel, etc.)

5. Type of Activity: Steam-Electric Generation
   (Residential subdivision, paper mill, state park, motel, etc.)

6. Description of Waste: Treated Domestic Sewage

7. Name of Landowner: Entergy Nuclear Vermont Yankee, LLC

8. Location: 320 Governor Hunt Rd Town: Vernon

9. If this application is for a permit renewal, is the previous application still valid in <u>all</u> respects? ☒Yes ☐No If no, document changes on a separate attachment. (Note: appropriate Schedule must be completed regardless if changes have occurred.)

(OVER)

10. Receiving Water for Indirect Discharges: Connecticut River

11. Pretreatment and Direct Discharges ONLY: Using a separate serial number (S/N), identify each independent discharge which will result from the activity described above. Attach a separate schedule for each discharge identified below.

Discharge	*Receiving Water*	*Latitude/Longitude (optional)*
S/N 001		
S/N 002		
S/N 003		
S/N 004		
S/N 005		

Use an attached sheet for additional discharges.

12. 3 V.S.A. Section 2822 Fees: Call 802-241-3822 for assistance calculating the application review fee.

$100.00 Administrative Processing Fee	**$100.00**	Does not apply to Emergency Pollution Permits
Plus Application Review Fee		Does not apply to renewal applications
Total Fee Enclosed	**$100.00**	Payment by check or money order, please

I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE INFORMATION SUBMITTED ABOVE IS TRUE, ACCURATE AND COMPLETE. I RECOGNIZE THAT BY SIGNING THIS APPLICATION I AM GIVING CONSENT TO EMPLOYEES OF THE STATE TO ENTER THE SUBJECT PROPERTY FOR THE PURPOSE OF PROCESSING THIS APPLICATION.

Samuel A. Wender IV Chemistry Superintendent

NAME AND TITLE OF APPLICANT OR LEGALLY AUTHORIZED REPRESENTATIVE (please print)

SIGNATURE 7/6/05 DATE

Lynn C. DeWald - Environmental Specialist

NAME AND TITLE OF CO-APPLICANT OR LEGALLY AUTHORIZED REPRESENTATIVE (please print)

SIGNATURE 6 July 2005 DATE

This application must be signed by the applicant or an officer in the applicant=s business, a municipal official, etc. The application CANNOT be signed by the applicant=s attorney, engineer, contractor, etc.

☐ **Submittal of Application:** Attach appropriate schedules, administrative processing and application review fees, plans, specifications and other supporting material. Send application to:

Vermont Department of Environmental Conservation
Wastewater Management Division
103 South Main Street - The Sewing Building
Waterbury VT 05671-0405

ATTACHMENT 2

2005 Annual Inspection Report

NORMANDEAU ASSOCIATES, INC.
25 Nashua Road
Bedford, NH 03110-5500
(603) 472-5191
(603) 472-7052 (Fax)
www.normandeau.com

File IDP
cc: Tietze
Elliott

RECEIVED
JUN 1 2005
By Lynn DeWald

May 27, 2005

Mr. John Akielaszek
Environmental Engineering Supervisor
Vermont Agency of Natural Resources
Department of Environmental Conservation
103 South Main Street, The Sewing Building
Waterbury, VT 05676-0405

RE: Annual Inspection of Wastewater Disposal Systems
Vermont Yankee Indirect Discharge Permit; ID-9-0036-2

Dear Mr. Akielaszek,

Enclosed is the annual inspection report for Entergy Nuclear Vermont Yankee LLC's (Vermont Yankee's) sewage collection, treatment, and disposal system. This report is submitted as required under section D.2 of Vermont Yankee's Indirect Discharge Permit. The inspection was conducted on April 12, 2005 by myself and John Pierce of Normandeau Associates. Our recommendations for corrective actions are summarized in Section IV of the report. Vermont Yankee will submit a schedule of implementation of needed repairs and maintenance by July 15, 2005.

Very truly yours,
NORMANDEAU ASSOCIATES, INC.

Richard A. Masters, P.E.
Director of Engineering

Cc:
Lynn DeWald, ENVY
Mark Mattson

APRIL 2005 ANNUAL INSPECTION OF WASTEWATER SYSTEMS AT THE VERMONT YANKEE NUCLEAR POWER PLANT INDIRECT DISHCARGE PERMIT ID-9-0036-2

Prepared for
ENTERGY NUCLEAR VERMONT YANKEE, LLC
322 Governor Hunt Road
P.O. Box 157
Vernon, VT 05354-0157

Prepared by

NORMANDEAU ASSOCIATES INC.
25 Nashua Road
Bedford, NH 03110-5500

R-18980.040

May 27, 2005

APRIL 2004 ANNUAL INSPECTION OF WASTEWATER SYSTEMS AT THE ENTERGY VERMONT YANKEE NUCLEAR POWER PLANT INDIRECT DISHCARGE PERMIT ID-9-0036-2

I. INTRODUCTION AND BACKGROUND

In accordance with Entergy Nuclear Vermont Yankee, LLC's (Vermont Yankee's) Indirect Discharge Permit (ID-9-0036-2) issued by the Vermont Department of Environmental Conservation, Normandeau Associates, Inc. inspected the wastewater disposal systems at Vermont Yankee in Vernon, Vermont. We inspected the facilities on April 12, 2005. This report documents the scope of the investigations, the observations made, and recommendations for follow-up maintenance and/or other improvements to the systems. This satisfies the annual inspection requirements of Section D.2 of the Indirect Discharge Permit. The following seven collection, treatment, and disposal systems were inspected:

1. Main (North)
2. COB (South)
3. New Warehouse
4. Governor Hunt House
5. Gate House
6. New Engineering Office Building (this building is commonly called the Plant Support Building (PSB), however, the permit refers to it as the New Engineering Office Building or New Office and so shall this report)
7. Power Uprate Building

Section II of this report describes the scope of the investigation. Section III details the findings of the inspection. Section IV provides a summary of recommendations, and Section V of the report documents the Permittee's commitment to implement the recommendations of this report.

II. SCOPE OF INVESTIGATIONS

Normandeau Associates, Inc. is under contract with Vermont Yankee to perform an annual inspection, evaluation and report of the complete sewage collection, treatment and disposal systems. Vermont Yankee's permit specifies that the inspection is to be conducted annually during the month of April. According to permit condition D.2, the annual inspection is to include:

A. verification of the use of alternate disposal fields (Main, New Warehouse, and New Engineering Office disposal systems);

B. verification of the proper operation of the lift station pumps and alarms;

C. inspecting the entire collection system, removing manhole covers to observe the condition of sewers and manholes, and noting any signs of inflow or excessive infiltration;

D. evaluating the accumulation of solids and scum in each septic tank and verifying the date of pumping of the tanks;

E. checking the proper distribution of flow and levelness of all distribution boxes in the disposal fields;

F. checking the depth of ponding in observation wells for those fields in use during the inspection;

G. checking the calibration of the effluent flow meter (if applicable); and

H. noting any necessary repairs or maintenance that needs to be performed.

As required by the permit, this annual inspection report includes:

A. a complete list of the items inspected and the results of the inspection;

B. a discussion of the recommended repairs and maintenance required; and

C. an evaluation of metered water use, depth of ponding and groundwater table levels in the vicinity of the disposal fields, as appropriate

The following section describes the findings of the April 12, 2005 inspection. Recommendations are noted in bold and are categorized as recommendations to either improve or correct wastewater system performance, or to correct related facilities that may be scheduled for general plant maintenance. Some recommendations fall into both categories.

III. FACILITIES INSPECTIONS

A. Main System

1. System Description

The Main (North) wastewater disposal system consists of four sanitary manholes (Sewer Manhole Nos. MS-1 through MS-4), two wastewater pumping stations, a 9,450 gallon septic tank, a 3,500 gallon secondary septic tank, a valve pit, and three leach fields.

2. Flow and Groundwater Conditions Evaluation

The system has a permit capacity of 4,950 gallons per day and an additional 10,000 gallons per day during outages. Flow data for the period April 2004 through March 2005 provided by Vermont Yankee are presented in Attachment 1. Daily flows to the Main System did not exceed the permit limits during this twelve month period.

All 10 observation wells for this system (PW 1-1 through PW 1-10) were dry.

3. Septic Tanks Evaluation

The septic tanks were opened and sludge and scum depths were measured at various locations. The results are provided in Table 1.

Table 1.

Original Tank

	Near Outlet	Middle Chamber	At Inlet
Sludge	1.2 ft	1.6 ft	0.5 ft
Scum	less than 1 in	Continuous, approx. 1 in	Loose and variable
Total Depth	4.1 ft	5.5 ft	5.5 ft

New Tank

	Near Outlet	At Inlet
Sludge	1.4 ft	1.4 ft
Scum	Negligible	Loose and variable
Total Depth	4.5 ft	4.5 ft

The septic tanks were last pumped on April 16, 2003 for routine scheduled maintenance.

The tank hatches of the Original tank remain in poor condition. Some hinges are broken, there are sharp rusted metal edges on some hatches, and gaps in the cover, which allow grass clippings and wind-blown debris to collect in the tank. The recommendation in the 2004 report to replace the hatches is reportedly in-progress.

Recommendation:

Replace hatches on Original Tank (Wastewater System Performance and Plant Maintenance Recommendation)

4. Pumping Stations Evaluation

Old Pump Station

The old pump station consists of a wet well and switch room, accessed by separate portals.

Both pumps were able to be activated by changing the pump switches from "auto" to "hand". The pumps were not activated by manually lifting the floats because this would require entering a confined space and maneuvering down a long ladder, which was in a slippery condition. Wastewater levels in the wet well were not unusually high, however, and there were no signs that the pumps were not routinely pumping effluent.

The sump pump had a small amount of water in the basin. No leaks were found upon manually activating the pump. The pump station floor was dry.

Recommendations:

Repair the overhead room light in the pump station (Plant Maintenance Recommendation).

New Pump Station

The new pump station pumps were able to be activated by manually raising the floats, however, neither pump was able to be activated by changing the pump switches from "auto" to "hand". The new pumping station alarm was observed to be functioning.

Recommendation: An electrician should check the manual pump switches (Plant Maintenance Recommendation)

5. Valve Pit Evaluation

The valve pit was opened and observations of its condition were made from the ground level. A small amount of water was observed on the floor, but the equipment appeared to be functional and in good repair.

Recommendation: None

6. Leach Field Evaluation

The leach field is a pressurized system. No surfacing sewage or septic odors were present.

The leach fields were rotated on March 12, 2004, as shown in Attachment 2.

Recommendation: None

7. Collection System Evaluation

The following observations were made at the collection system manholes:

a. Sewer Manhole MS-1

Location:	On north side of new warehouse. Also marked as MH-43
Flow Condition:	Minimal flow observed. Some debris and scum in the trough; partial blockage of trough and floor.
Material Condition:	Concrete pipe manhole with aluminum steps; no irregularities observed. No signs of inflow or excess infiltration.
Recommendation:	**Clean the manhole (Wastewater Operation Recommendation).**

b. Sewer Manhole MS-2

Location:	Near the center of the Turbine Building on the west side. Also marked as MH-17. Landscaping rocks covered the manhole and were moved aside.
Flow Condition:	Some sludge and scum accumulation on the floor and the trough. Minimal flow
Material Condition:	Concrete pipe manhole; no irregularities observed. No stairs in manhole. The inflow protector cover below the manhole appears to be effective in reducing inflow.
Recommendation:	**Clean the manhole (Wastewater Operation Recommendation).**

c. Sewer Manhole MS-3

Location:	Between Gate 2 and Administration Building.
Flow Condition:	Minimal flow observed. Some debris and scum. No signs of inflow or excess infiltration.

Material Condition: Concrete pipe manhole; no irregularities observed. No steps in manhole. No signs of inflow or excess infiltration.

Recommendations:

a. Clean the manhole (Wastewater Operation Recommendation).

b. Stencil manhole number on manhole lid (Plant Maintenance Recommendation).

d. Sewer Manhole MS-4

Location: On west side of North warehouse. Also marked as MH-19.

Flow Condition: Moderate flow observed. Some scum/debris accumulation observed in the trough.

Material Condition: Concrete pipe; no irregularities observed; no steps in manhole. No signs of inflow or excess infiltration.

Recommendation: Clean the manhole (Wastewater Operation Recommendation).

B. COB (Construction Office Building) System

1. System Description

The COB (South) wastewater disposal system consists of three sanitary manholes, a 5,000 gallon septic tank with effluent filter, a wastewater pumping station, two valve pits, and two pressurized mound disposal fields. The COB leachfield system accepts flow from the Power Uprate Building septic tank.

2. Flow and Groundwater Conditions Evaluation

The system has a permit capacity of 4,607 gallons per day. Flow data for April 2004 through March 2005 provided by Vermont Yankee are presented in Attachment 1. Daily flows to the COB System did not exceed the permit limits during this period.

3. Septic Tank Evaluation

The septic tank was opened and sludge and scum depths were measured in two locations. The results are summarized in Table 2.

Table 2.

	Near Outlet	Near Inlet
Sludge	0.4 ft	0.3
Scum	Light and variable	1.3
Total Depth	5.8 ft	5.8 ft

The filter on the septic tank outlet was checked and found to be reasonably clean. The septic tank was pumped in the Fall of 2003 prior to the April 2004 Outage. Although the outlet side of the tank is clean, the thick scum mat on the inlet side warrants attention to prevent a potential blockage. This tank was pumped on May 13, 2005, subsequent to the annual system inspection

Recommendation: None

4. Pump Station Evaluation

The wet well of this submersible pump station was opened and satisfactory operation of the pumps was observed. The pumps were able to be activated by manually raising the floats and by operating the pump switches on the new control panel. The high water visual and audio alarm was observed to be functioning. Observations of the wet well were made from the ground level through the access cover.

Recommendation: None

5. Leach Field Evaluation

The leach fields are pressurized. No surfacing sewage or septic odors were present. All of the ponding wells on the new (Replacement) field were dry (CB-1 to CB-6).

Recommendation: None

6. Collection System Evaluation

The following observations were made at the collection system manholes:

a. Sewer Manhole COB-1

Location:	Outside of fence at southwest corner of the plant.
Flow Condition:	No flow observed. Channel mostly clean, some grit observed.
Material Condition:	Brick manhole with plastic steps; no irregularities found. No signs of inflow or excess infiltration.
Recommendations:	**None**

b. Sewer Manhole COB-2

Location:	Outside of fence due east of above manhole.
Flow Condition:	Moderate flow observed. Channel mostly clean.
Material Condition:	Brick manhole with plastic steps; no irregularities found. No signs of inflow or excess infiltration.
Recommendations:	**None**

c. Sewer Manhole COB-3

Location:	Adjacent to above manholes in parking lot.
Flow Condition:	Minimal flow observed. Channel mostly clean, some grit observed.
Material Condition:	Brick manhole with plastic steps; no irregularities found. No signs of inflow or excess infiltration.
Recommendations:	**None**

7. Valve Pits Evaluation

The two valve pits were opened and observations of their condition were made from the ground level. Water was observed on the floor of the valve pit, however, all of the facilities appeared to be in satisfactory condition.

Recommendation: None

C. New Warehouse System

1. System Description

The New Warehouse wastewater disposal system consists of two manholes, a 3,000 gallon septic tank, a wastewater pump station, a valve pit, and two pressurized leach fields.

2. Flow and Groundwater Conditions Evaluation

The system has a permit capacity of 2,000 gallons per day and 4,000 gallons per day during outages. Flow data for the period April 2004 through March 2005 provided by Vermont Yankee are presented in Attachment 1. Daily flows to the New Warehouse System did not exceed the permit limits during this period.

Ponding wells 2-1 through 2-3 were dry. Well 2-4 was unable to be located and was probably damaged from construction activities. Replacement of this well is reportedly in-progress.

Recommendation: Replace PW 2-4 (Wastewater Operation Recommendation).

3. Septic Tank Evaluation

The inflow protection covers over the septic tank manholes appear to be preventing inflow. The septic tank was opened and sludge and scum depths were measured in two locations. The results are provided in Table 3.

Table 3.

	Near Inlet	Near Outlet
Sludge	Dense and continuous sludge and scum throughout depth of tank	0.5 ft
Scum	See above	Negligible
Total Depth	5.0 ft	5.0 ft

The septic tank was pumped August 8, 2003 and again on May 13, 2005, subsequent to the annual system inspection.

Recommendation: None.

4. Pump Station Evaluation

The pumps were able to be activated by manually raising the floats. Satisfactory operation of the pumps was observed.

Recommendation: None.

5. Valve Pit Evaluation

The valve pit was opened and an observation of its condition was made from the ground level. The equipment appeared to be functional and in good repair.

Recommendation: None

6. Leach Field Evaluation

The leach field is a pressurized system. No surfacing sewage or septic odors were present.

The leach fields were rotated on May 12, 2004, as shown in Attachment 2.

Recommendation: None

7. Collection System Evaluation

The following observations were made of the manholes:

a. Sewer Manhole NW-1

Location:	On southwest side of New Warehouse building. Also marked as MH-41.5
Flow Condition:	Minimal flow, debris observed in trough.
Recommendation:	**Clean the manhole (Wastewater Operation Recommendation).**

b. Sewer Manhole NW-2

Location:	On southeast side of New Warehouse. Also marked as MH-42
Flow Condition:	No flow observed; ponded water in trough. Significant debris accumulation in trough.

Material Condition: Concrete manhole with aluminum steps; no irregularities found. The inflow protector cover below the manhole appears to be effective in reducing inflow.

Recommendation: Clean the manhole (Wastewater Operation Recommendation).

D. Gate House System

1. System Description

The Gate House System consists of a 1,000 gallon septic tank, a distribution box and a leach field. The system has a permit capacity of 990 gallons per day.

2. System Evaluation

The upstream port of the septic tank was opened and sludge and scum depths were measured. The results are presented in Table 4.

Table 4.

	Inlet	Outlet
Sludge	less than 1 in	0.4 ft
Scum	Continuous and less than 1 in	Negligible
Total Depth	4.0 ft	4.0 ft

The septic tank was last pumped on April 16, 2003 for routine scheduled maintenance.

The distribution box was not found and is assumed to be buried.

No surfacing sewage or septic odors were present in the leach field.

Recommendation: None

E. Governor Hunt System

1. System Description

The Governor Hunt House System consists of a 1,000 gallon septic tank, a distribution box, and a leach field. The system has a permit capacity of 540 gallons per day.

2. System Evaluation

The septic tank was opened and sludge and scum depths were measured. The results are presented in Table 5.

Table 5.

	Middle
Sludge	0.5 ft
Scum	Continuous, less than 1 in
Total Depth	4.9 ft

The septic tank was last pumped on April 11, 2001. It should be noted that since September 2001, the occupation of this building has been discontinued with the exception of occasional meetings.

The distribution box was opened; it appeared to be functional and in good repair.

No surfacing sewage or septic odors were present in the leach field.

Recommendation: None

F. New Engineering Office Building System

1. System Description

The New Engineering Office Building system consists of a cleanout, 3,000 gallon septic tank, pump station, valve pit, and two leach fields.

2. Flow and Groundwater Conditions Evaluation

The system has a design capacity of 2,160 gpd. Flow data for the period April 2004 through March 2005 provided by Vermont Yankee are presented in Attachment 1. Flows to the New Engineering Office Building System did not exceed the permit limit during this period.

All observation wells for the New Engineering Office Building System (PW 3-1 through PW 3-6) were dry.

3. Septic Tank Evaluation

The septic tank was opened and sludge and scum depths were measured at two locations as shown in Table 6.

Table 6.

	Near Outlet	Near Inlet
Sludge	0.0 ft	0.0 ft
Scum	Negligible	0.0 ft
Total Depth	3.8 ft	4.0 ft

The tank was pumped on March 28, 2005, 15 days prior to our inspection. Each year since this tank was placed in service, it has been observed that the inlet side of the tank has significant accumulations of sludge and scum. The downstream side of the tank, however, typically shows very little accumulations of sludge and scum, which indicates that the tank is protecting the leach field. The accumulations in the inlet side, however, could cause blockage and flow backup in the building if not removed frequently. Therefore, this tank should continue to be pumped on at least an annual basis.

Recommendations: None

4. Pump Station Evaluation

The wet well of this submersible pumping station was opened and satisfactory operation of the pumps was observed. Both pumps were activated by manually adjusting the floats to simulate high water levels. The audio and visual alarm system was observed to operate as designed. No corrosion or unusual conditions were observed.

Recommendation: None

5. Valve Pit Evaluation

The access cover to the valve pit was removed and the valves and piping were observed from ground level. Some water was observed on the floor, but there were no visible leaks from the system.

Recommendation: None

6. Leach Field Evaluation

The leach field is a two-field pressurized system. No surfacing sewage or septic odors were present on either field. The leach fields were rotated on September 29, 2004, as shown in Attachment 2.

Recommendation: None

G. **Power Uprate Building System**

1. System Description

The Power Uprate Office Building system consists of a 1,500 gallon septic tank, a pump station, and a force main sewer pipe to connect the system to the COB system leachfields.

2. System Evaluation

The septic tank was opened and sludge and scum depths were measured. The results are presented in Table 6.

Table 6.

	Inlet	Outlet
Sludge	0.2 ft	0.2 ft
Scum	Light and variable	Light and variable
Total Depth	3.5 ft	3.5 ft

Recommendation: None

3. Pump Station Evaluation

The wet well of this submersible pumping station was opened and satisfactory operation of the pumping unit was observed. The pump was activated by manually adjusting the floats to simulate high water levels. The audio and visual alarm system was observed to operate as designed. No unusual conditions were observed.

Recommendation: None

IV. SUMMARY OF RECOMMENDATIONS

The following summarizes the recommendations presented in Section III above. While a number of recommendations are presented to restore or enhance performance of the wastewater system, some of the recommendations are for ancillary purposes (e.g., repair lights). Therefore, the following list has been categorized into recommendations for the

wastewater system and for general plant maintenance. The intent is to identify recommendations that should be implemented to address and focus on the wastewater system performance, and those that should be included in the plant overall corrective maintenance program.

A. **Wastewater System Performance Recommendations:**

1. **Main System**

   a. Replace hatches on Original Tank

   b. Clean manholes MS-1 through MS-4.

2. **New Warehouse System**

   a. Replace PW 2-4

   b. Clean Manholes NW-1 and NW-2

B. **Plant Corrective Maintenance Recommendations:**

Main System

a. Replace hatches on Original Tank (also noted in A. above)

b. Repair the overhead room light in the pump station

c. An electrician should check the manual pump switches

d. Stencil the manhole number on manhole lid for MS-3 (MH-18)

V. SCHEDULE FOR CORRECTIVE ACTION

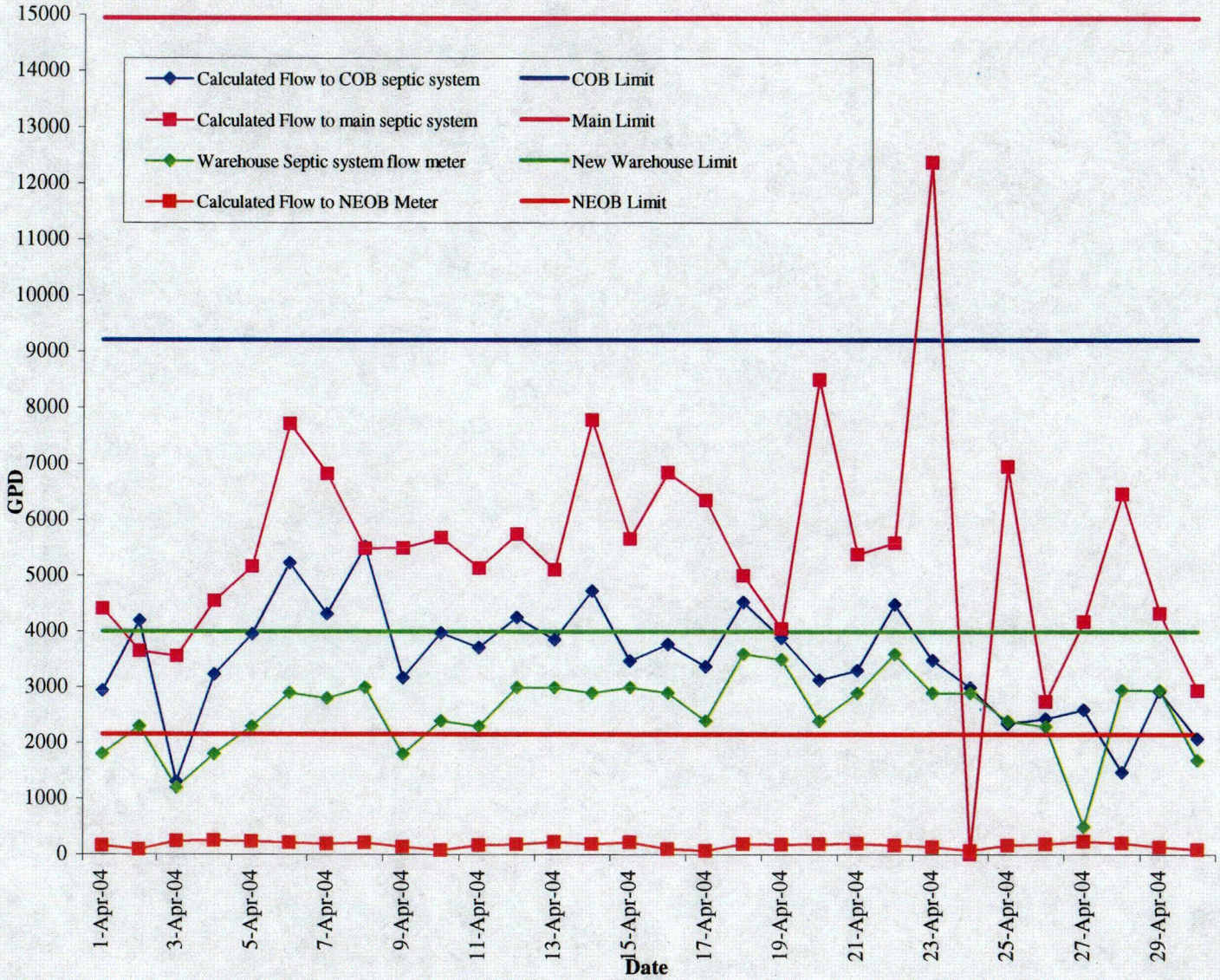
Vermont Yankee will take corrective action on the wastewater system performance items indicated above before the 2006 inspection. Vermont Yankee is required by their indirect discharge permit to submit a corrective action plan to the State by July 15, 2005.

ATTACHMENT 1

DAILY WASTEWATER FLOWS AND PERMIT LIMITS
VERMONT YANKEE NUCLEAR POWER PLANT

APRIL 2004 – MARCH 2005

VY Potable Water Usage/Septic System Flow - April 2004



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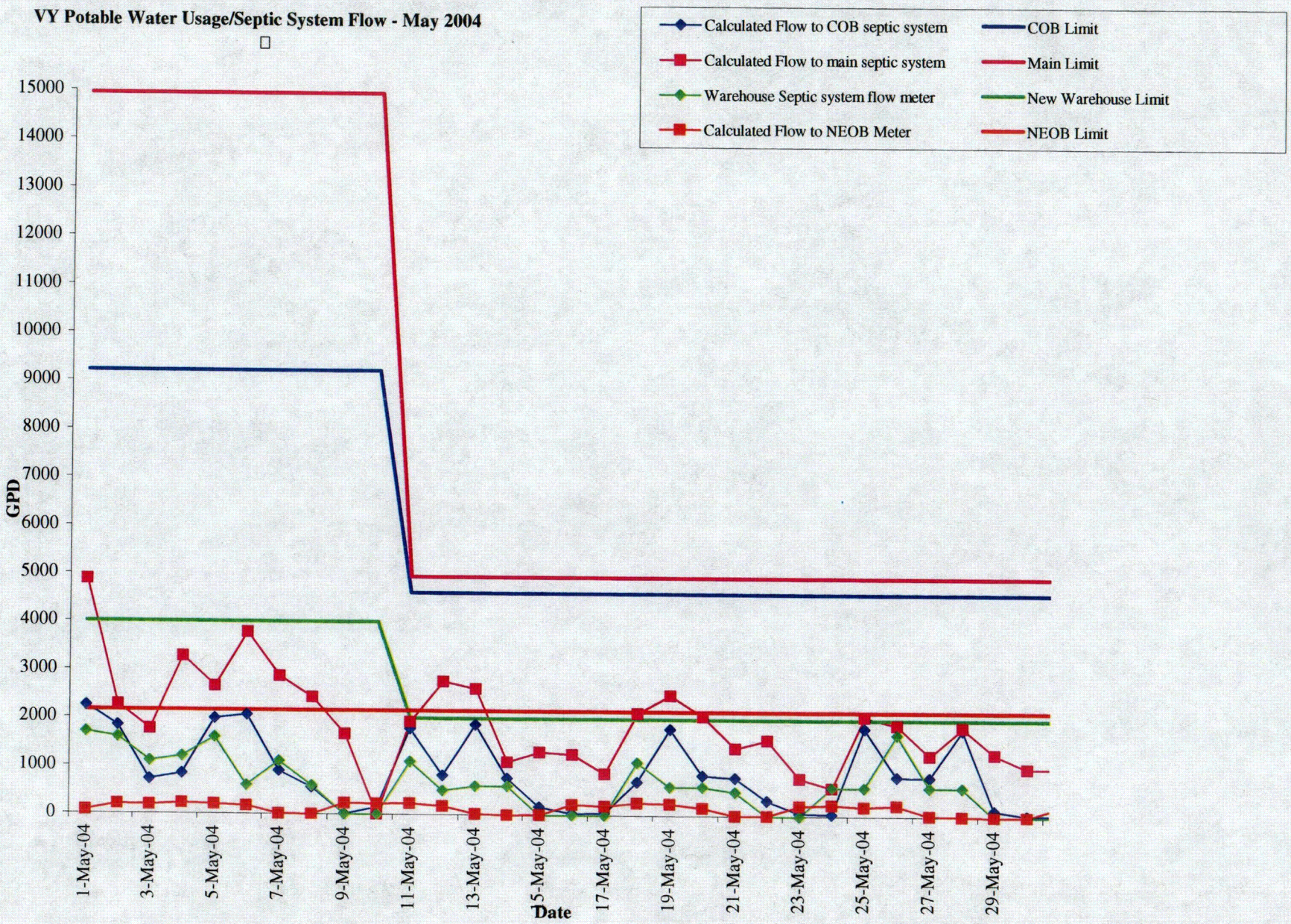
VY Potable Water Usage/Septic System Flow - May 2004
Calculated Flow to COB septic system
COB Limit
Calculated Flow to main septic system
Main Limit
Warehouse Septic system flow meter
New Warehouse Limit
Calculated Flow to NEOB Meter
NEOB Limit
GPD
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
1-May-04
3-May-04
5-May-04
7-May-04
9-May-04
11-May-04
13-May-04
15-May-04
17-May-04
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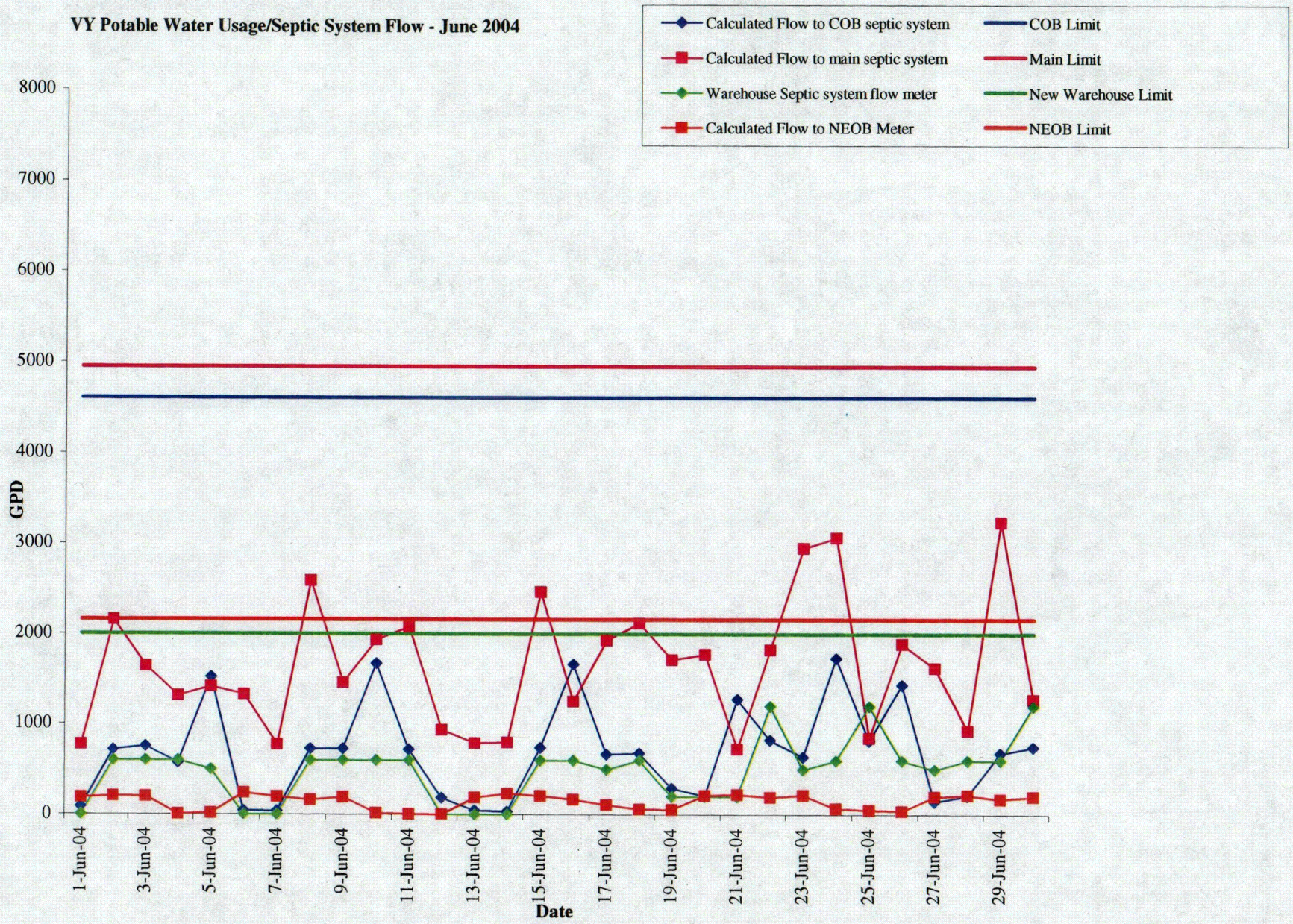
29-May-04
Date

C02


VY Potable Water Usage/Septic System Flow - June 2004
Calculated Flow to COB septic system
Calculated Flow to main septic system
Warehouse Septic system flow meter
Calculated Flow to NEOB Meter
COB Limit
Main Limit
New Warehouse Limit
NEOB Limit
GPD
8000
7000
6000
5000
4000
3000
2000
1000
0
1-Jun-04
3-Jun-04
5-Jun-04
7-Jun-04
9-Jun-04
11-Jun-04
13-Jun-04
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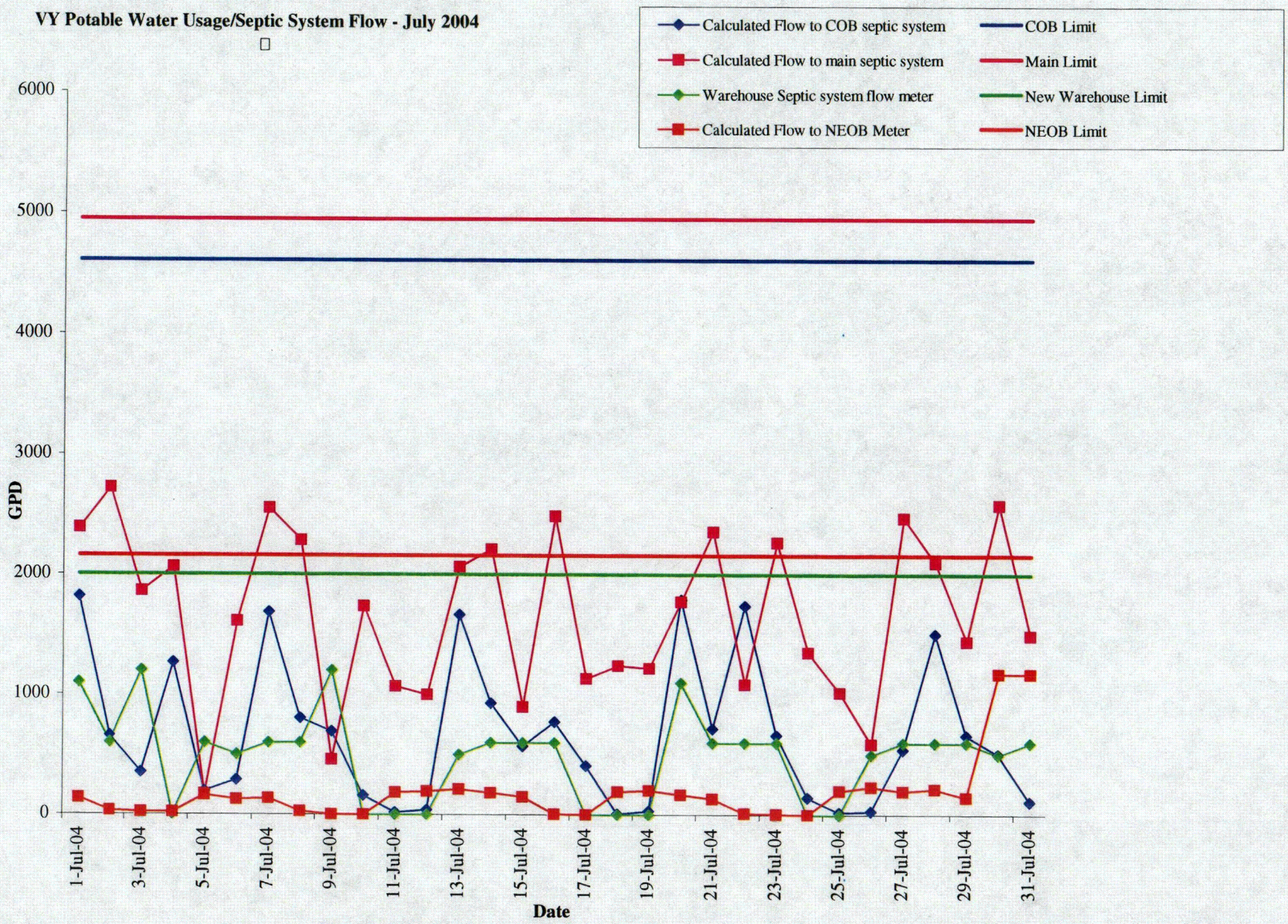
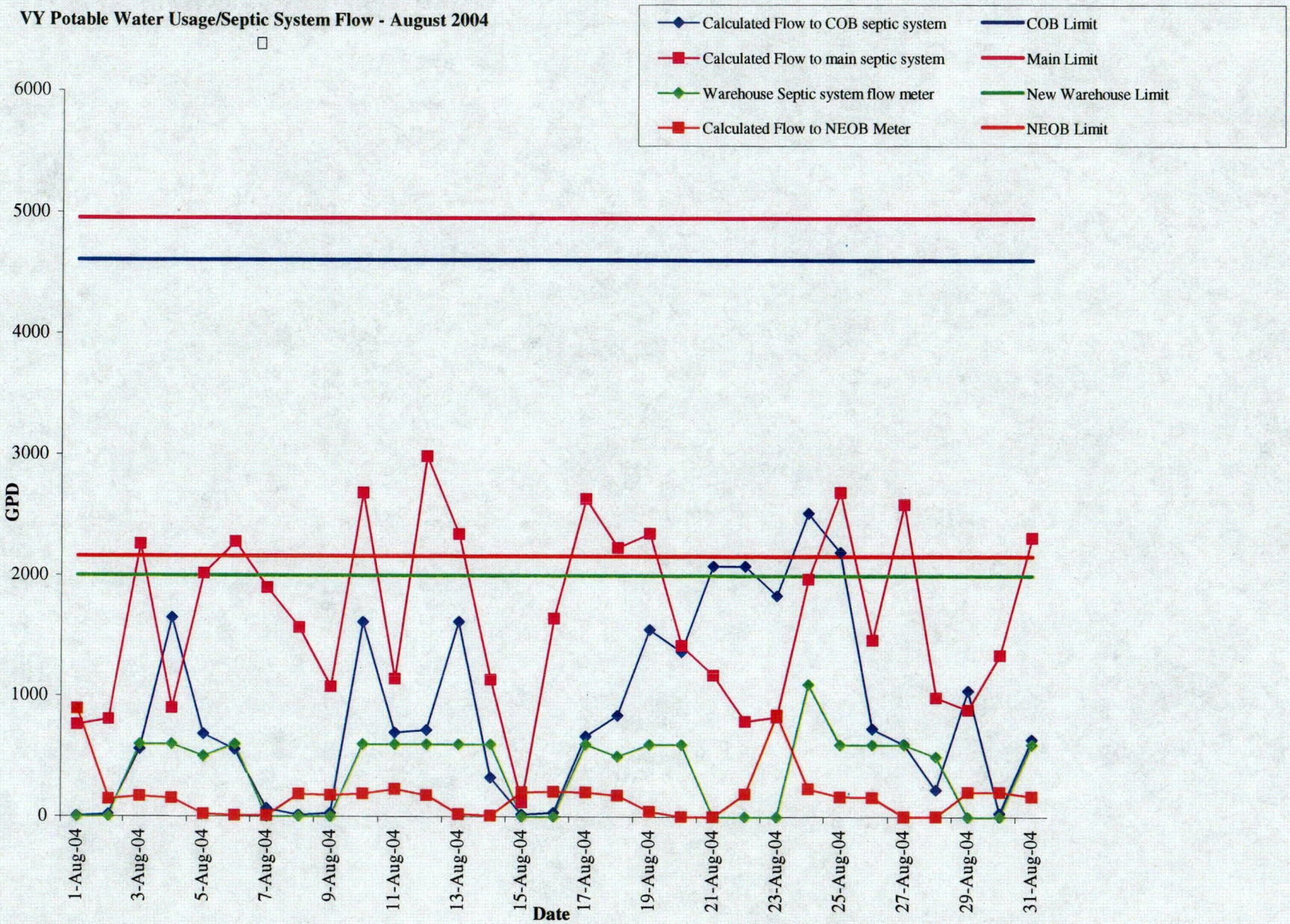
27-Jun-04
29-Jun-04
Date

C03


VY Potable Water Usage/Septic System Flow - July 2004
Calculated Flow to COB septic system
Calculated Flow to main septic system
Warehouse Septic system flow meter
Calculated Flow to NEOB Meter
COB Limit
Main Limit
New Warehouse Limit
NEOB Limit
GPD
6000
5000
4000
3000
2000
1000
0
1-Jul-04
3-Jul-04
5-Jul-04
7-Jul-04
9-Jul-04
11-Jul-04
13-Jul-04
15-Jul-04
17-Jul-04
19-Jul-04
21-Jul-04
23-Jul-04
25-Jul-04
27-Jul-04
29-Jul-04
31-Jul-04
Date

C04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Calculated Flow to COB septic system
Calculated Flow to main septic system
Warehouse Septic system flow meter
Calculated Flow to NEOB Meter
COB Limit
Main Limit
New Warehouse Limit
NEOB Limit
GPD
6000
5000
4000
3000
2000
1000
0
1-Aug-04
3-Aug-04
5-Aug-04
7-Aug-04
9-Aug-04
11-Aug-04
13-Aug-04
15-Aug-04
17-Aug-04
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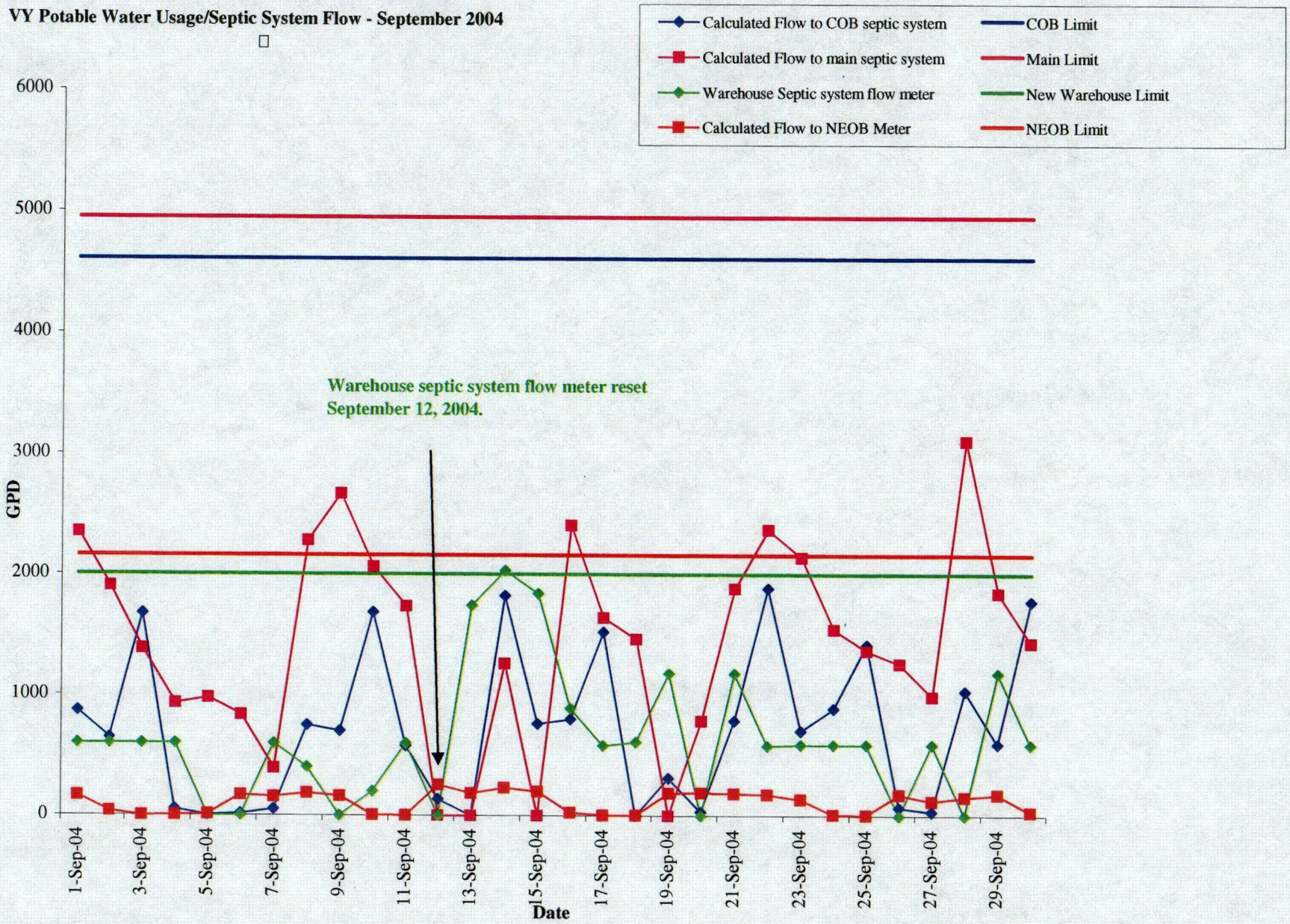
31-Aug-04
Date

C05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Calculated Flow to COB septic system
Calculated Flow to main septic system
Warehouse Septic system flow meter
Calculated Flow to NEOB Meter
COB Limit
Main Limit
New Warehouse Limit
NEOB Limit
Warehouse septic system flow meter reset
September 12, 2004.
GPD
6000
5000
4000
3000
2000
1000
0
1-Sep-04
3-Sep-04
5-Sep-04
7-Sep-04
9-Sep-04
11-Sep-04
13-Sep-04
15-Sep-04
17-Sep-04
19-Sep-04
21-Sep-04
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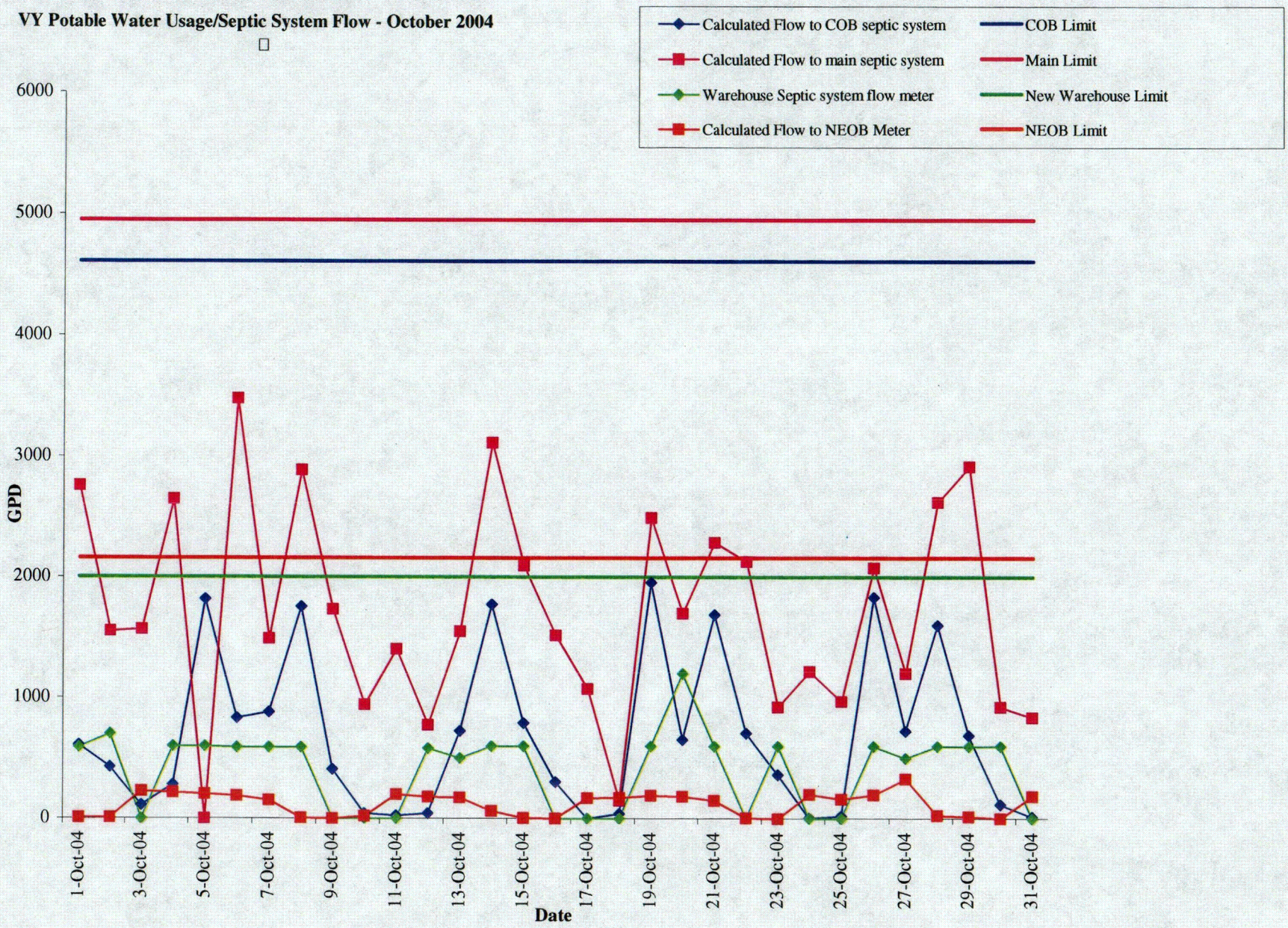
27-Sep-04
29-Sep-04
Date

C3C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Calculated Flow to COB septic system
Calculated Flow to main septic system
Warehouse Septic system flow meter
Calculated Flow to NEOB Meter
COB Limit
Main Limit
New Warehouse Limit
NEOB Limit
GPD
6000
5000
4000
3000
2000
1000
0
1-Oct-04
3-Oct-04
5-Oct-04
7-Oct-04
9-Oct-04
11-Oct-04
13-Oct-04
15-Oct-04
17-Oct-04
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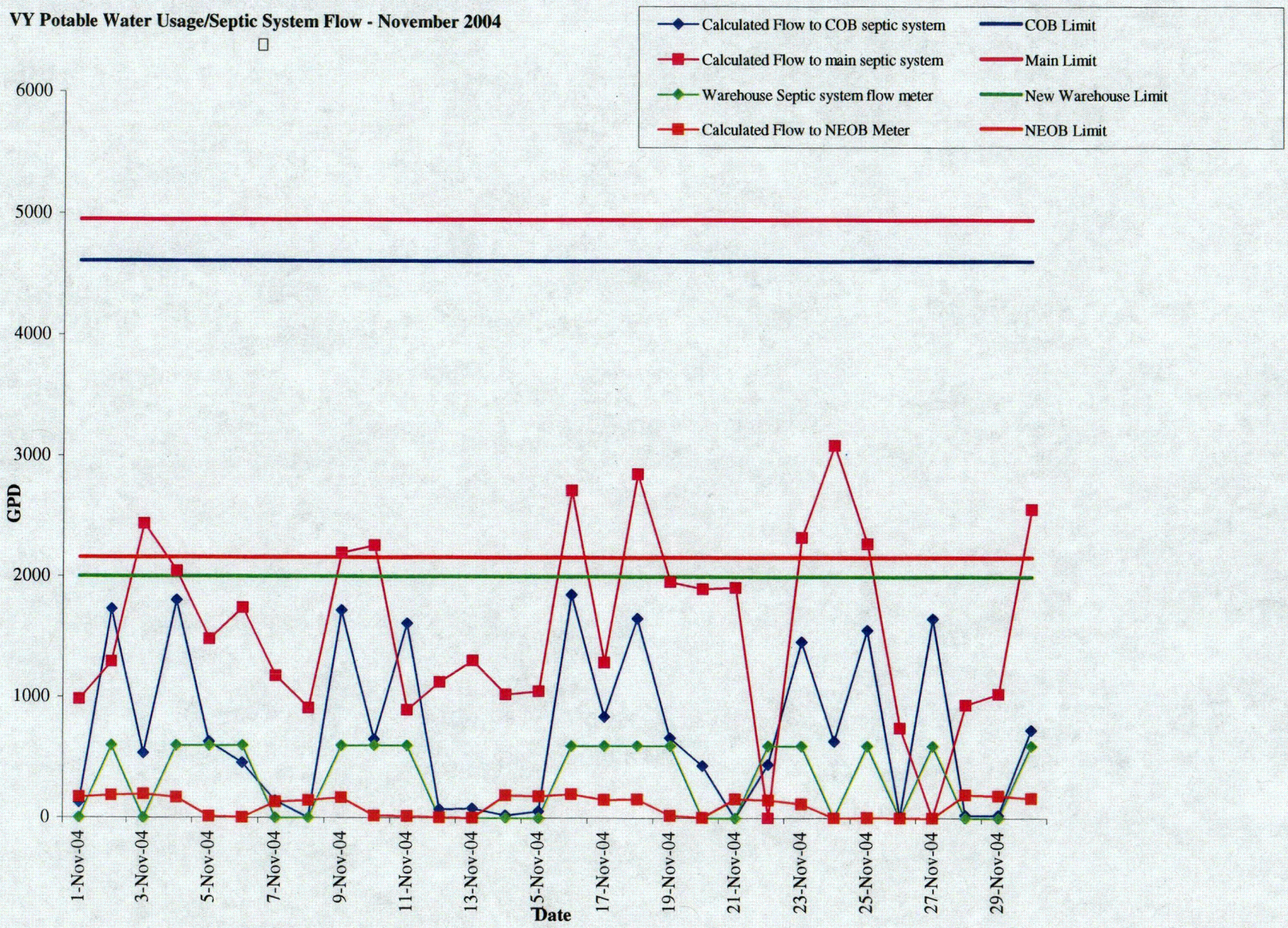
31-Oct-04
Date

C07


VY Potable Water Usage/Septic System Flow - November 2004
Calculated Flow to COB septic system
COB Limit
Calculated Flow to main septic system
Main Limit
Warehouse Septic system flow meter
New Warehouse Limit
Calculated Flow to NEOB Meter
NEOB Limit
GPD
6000
5000
4000
3000
2000
1000
0
1-Nov-04
3-Nov-04
5-Nov-04
7-Nov-04
9-Nov-04
11-Nov-04
13-Nov-04
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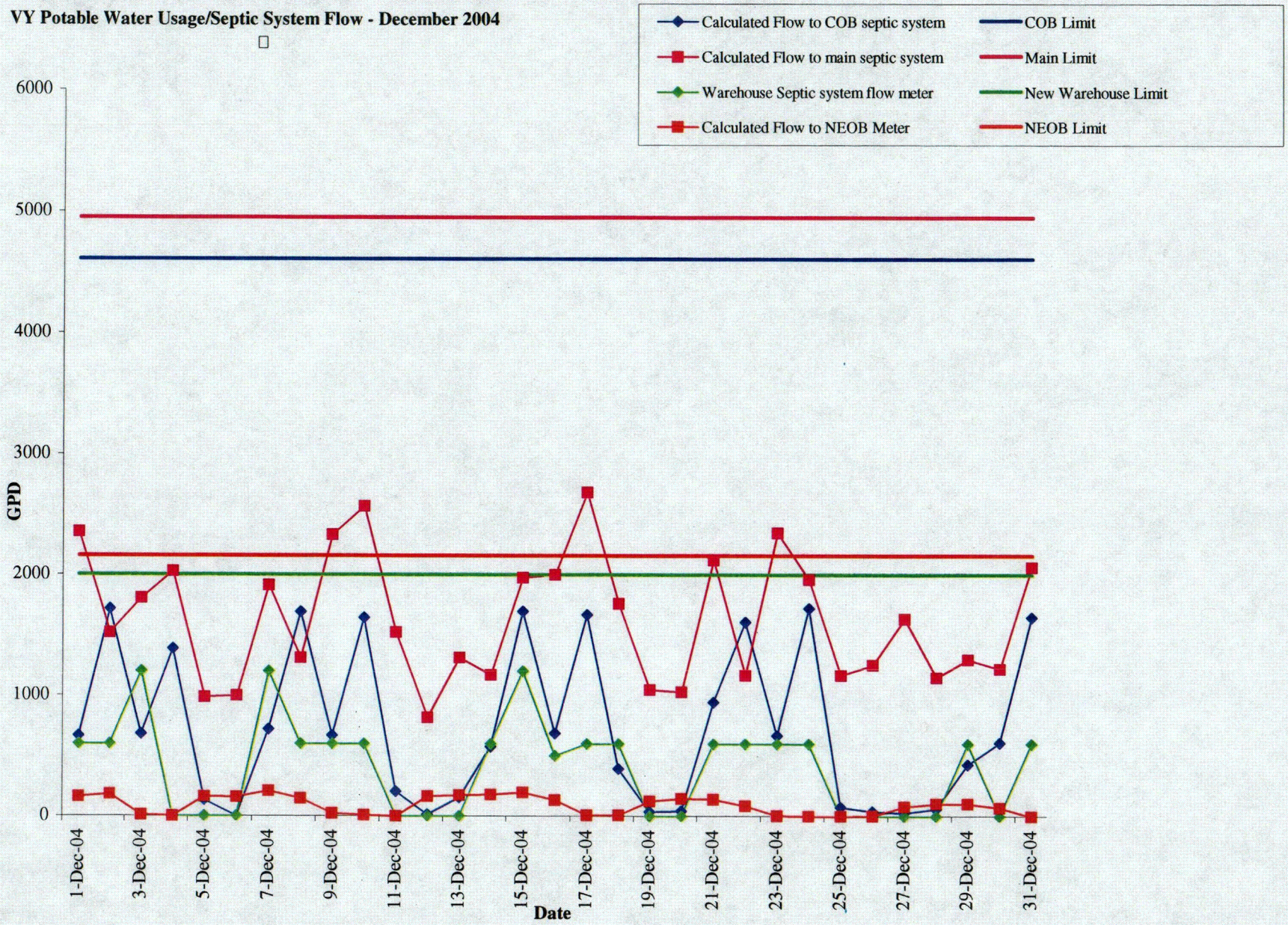
29-Nov-04
Date

COB


VY Potable Water Usage/Septic System Flow - December 2004
Calculated Flow to COB septic system
Calculated Flow to main septic system
Warehouse Septic system flow meter
Calculated Flow to NEOB Meter
COB Limit
Main Limit
New Warehouse Limit
NEOB Limit
GPD
6000
5000
4000
3000
2000
1000
0
1-Dec-04
3-Dec-04
5-Dec-04
7-Dec-04
9-Dec-04
11-Dec-04
13-Dec-04
15-Dec-04
17-Dec-04
19-Dec-04
21-Dec-04
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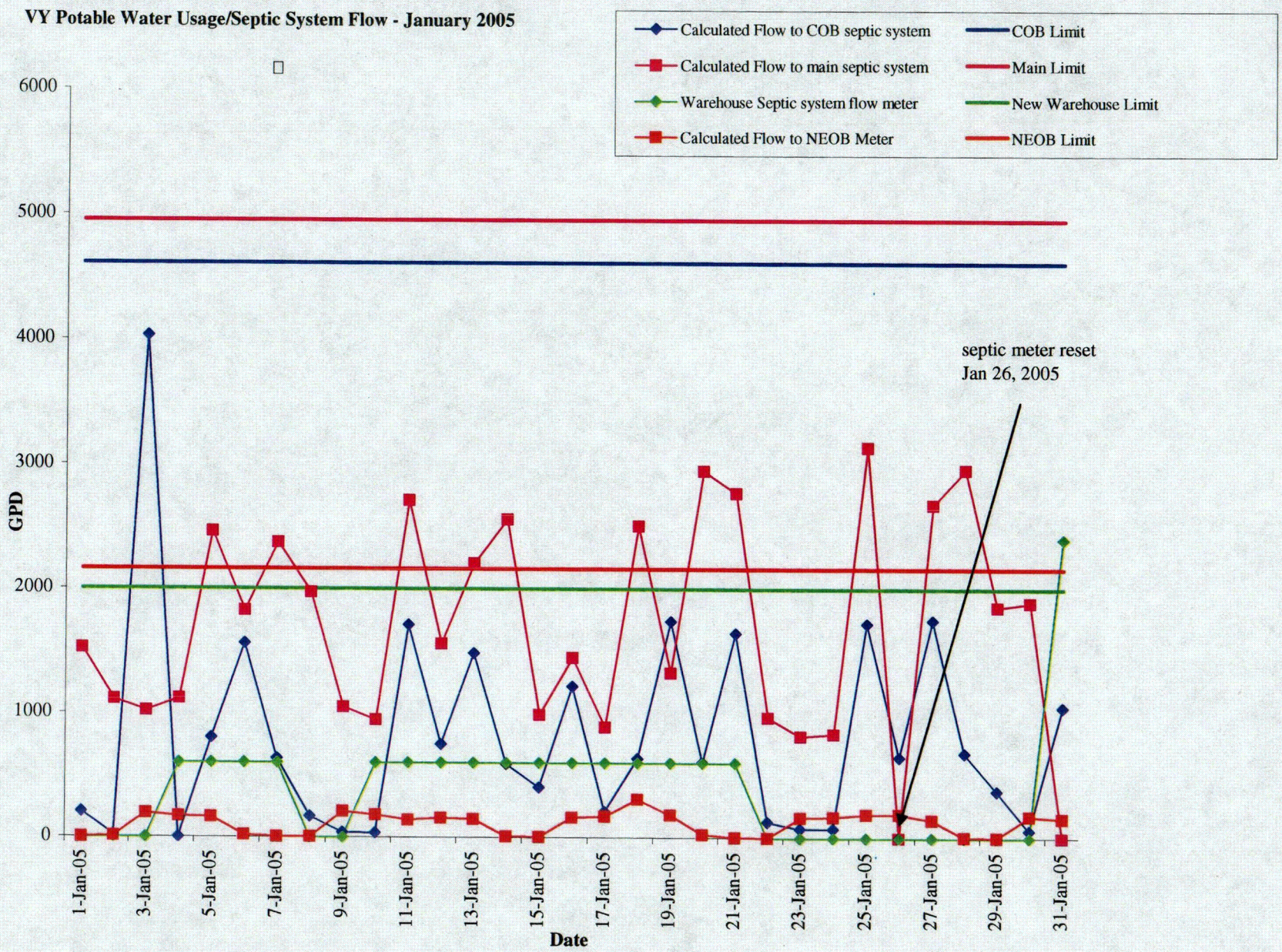
29-Dec-04
31-Dec-04
Date

C01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Calculated Flow to COB septic system
Calculated Flow to main septic system
Warehouse Septic system flow meter
Calculated Flow to NEOB Meter
COB Limit
Main Limit
New Warehouse Limit
NEOB Limit
septic meter reset
Jan 26, 2005
GPD
6000
5000
4000
3000
2000
1000
0
1-Jan-05
3-Jan-05
5-Jan-05
7-Jan-05
9-Jan-05
11-Jan-05
13-Jan-05
15-Jan-05
17-Jan-05
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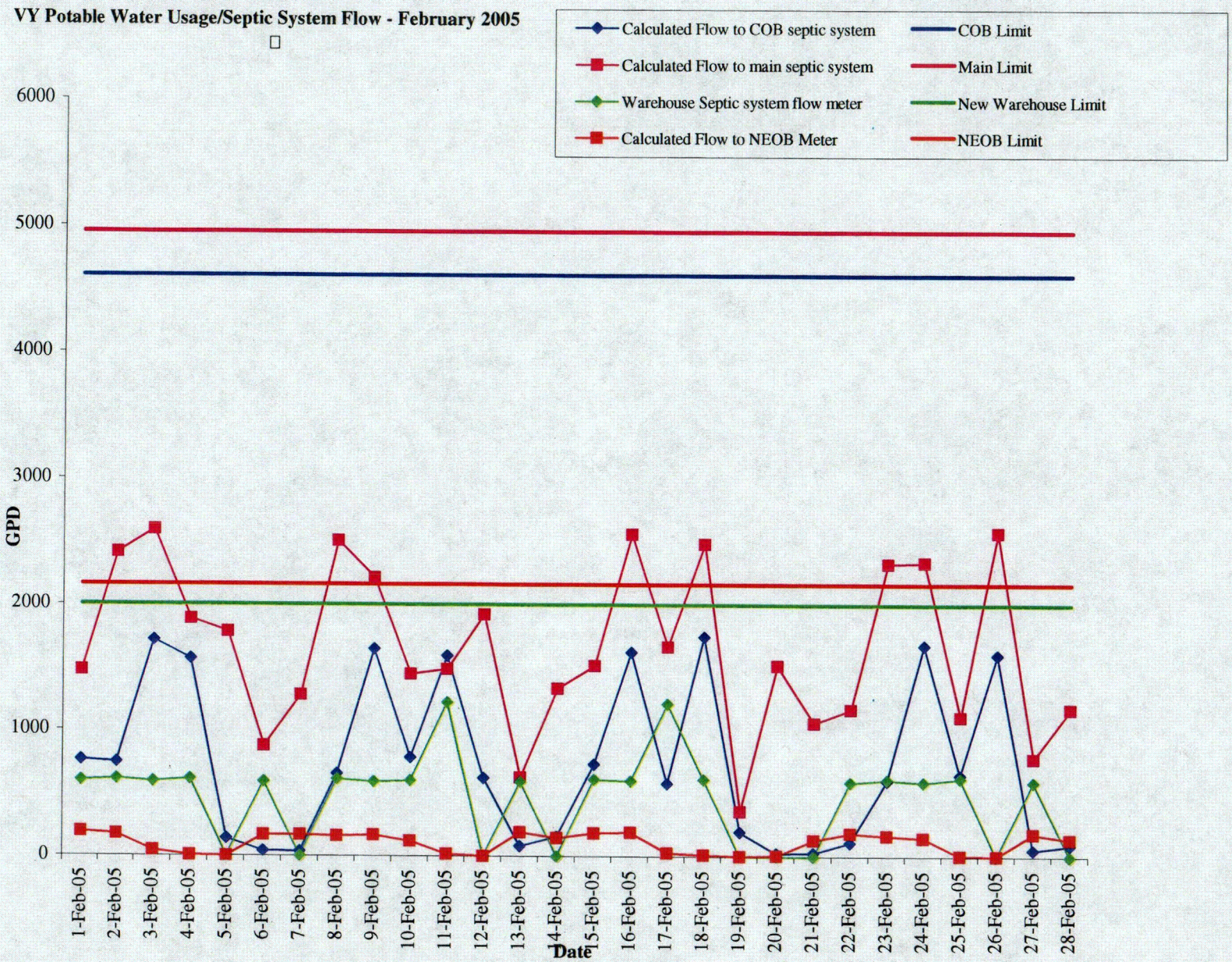
27-Jan-05
29-Jan-05
31-Jan-05
Date

C10


VY Potable Water Usage/Septic System Flow - February 2005
Calculated Flow to COB septic system
COB Limit
Calculated Flow to main septic system
Main Limit
Warehouse Septic system flow meter
New Warehouse Limit
Calculated Flow to NEOB Meter
NEOB Limit
GPD
6000
5000
4000
3000
2000
1000
0
1-Feb-05
2-Feb-05
3-Feb-05
4-Feb-05
5-Feb-05
6-Feb-05
7-Feb-05
8-Feb-05
9-Feb-05
10-Feb-05
11-Feb-05
12-Feb-05
13-Feb-05
14-Feb-05
15-Feb-05
16-Feb-05
17-Feb-05
18-Feb-05
19-Feb-05
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25-Feb-05
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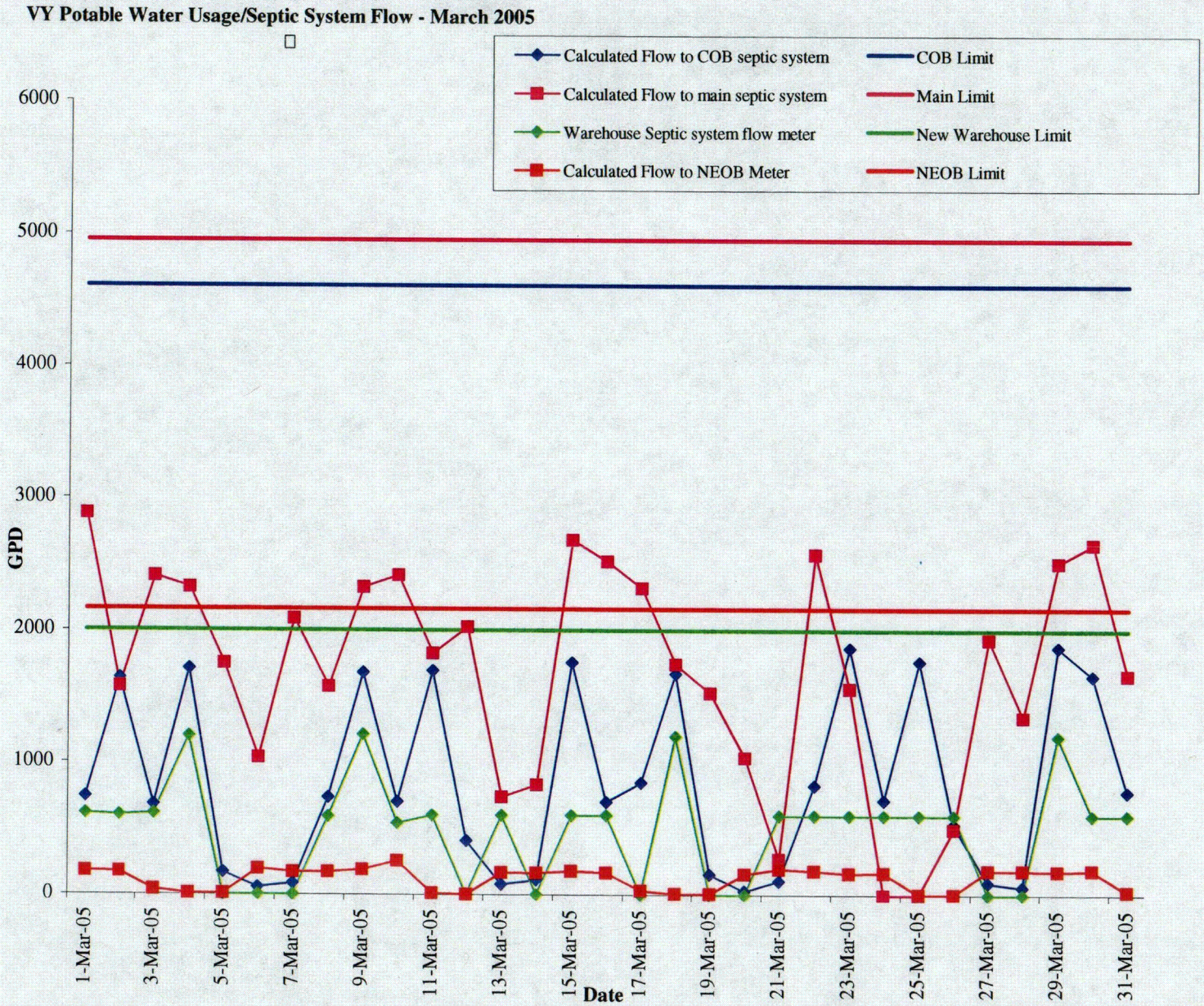
28-Feb-05
Date

C11


VY Potable Water Usage/Septic System Flow - March 2005
Calculated Flow to COB septic system
COB Limit
Calculated Flow to main septic system
Main Limit
Warehouse Septic system flow meter
New Warehouse Limit
Calculated Flow to NEOB Meter
NEOB Limit
GPD
6000
5000
4000
3000
2000
1000
0
1-Mar-05
3-Mar-05
5-Mar-05
7-Mar-05
9-Mar-05
11-Mar-05
13-Mar-05
15-Mar-05
17-Mar-05
19-Mar-05
21-Mar-05
23-Mar-05
25-Mar-05
27-Mar-05
29-Mar-05
31-Mar-05
Date

C12

ATTACHMENT 2

LEACHFIELD ROTATION DOCUMENTS
VERMONT YANKEE NUCLEAR POWER PLANT

APRIL 2004 – MARCH 2005

SINGLE MAIN LEACH FIELD OPERATION DURING NORMAL PERIODS

NOTE

The leach field in service should be rotated at least annually.

1. Record the date/time the Main Leach Field was placed in/removed from service as applicable:

   a. Main Leach Field (1) (2,3) placed in service (circle one). 5/12/04 / 0007
   Date Time

   b. Main Leach Field 1, (2,3) removed from service (circle one).
   5/12/04 / 0007
   Date Time

(2) Perform the following on the local control panel:

   ~~a.~~ Place the Field Mode Selector switch to NORMAL DUTY.

   ~~b.~~ If the leach field is being returned to normal alignment following an outage, the same leach field that was in service when the outage began shall be returned to service when the outage is over.

   ~~c.~~ Place the required leach field in continuous operation by placing the Normal Duty Valve Selector to the appropriate leach field 1 (2,3).

      ~~1)~~ Record the date the selected leach field is placed in service.

      ~~2)~~ Record the date the non-selected leach field is removed from service.

   ~~d.~~ Confirm or place Leach Field 1, 2 and 3 Inlet Valve control switches to AUTO.

   ~~e.~~ Confirm or place the control switch for waste water Pump 1 to AUTO.

   ~~f.~~ Confirm or place the control switch for waste water Pump 2 to AUTO.

Comments:

Performed By: A. Rogerich / [signature] / 5/12/04
Print/Sign Date

/
Print/Sign Date

Reviewed By: Gary Van Der Esch / [signature] / 5-12-04
Shift Manager (Print/Sign) Date

SINGLE WAREHOUSE LEACH FIELD OPERATION DURING NORMAL PERIODS

NOTE

The leach field in service should be rotated at least annually.

1. Record the date/time the Warehouse Leach Field was placed in/removed from service as applicable:

   a. Warehouse Leach Field (1)(2) placed in service (circle one). 5/12/2004 / 1023 (Date / Time)

   b. Warehouse Leach Field 1 (2) removed from service (circle one). 5/12/2004 / 1023 (Date / Time)

2. Perform the following on the local control panel:

   a. If the leach field is being returned to normal alignment following an outage, the same leach field that was in service when the outage began shall be returned to service when the outage is over.

   b. Place the mode selector switch to FIELD (1)(2) OPEN as desired.

      1) Verify FIELD (1)(2) VALVE opens.

   c. Confirm or place WASTE PUMP A PUMP NO 1 control switch to AUTO.

   d. Confirm or place WASTE PUMP B PUMP NO 2 control switch to AUTO.

   e. Take the LEVEL ALARM reset control switch to the OFF-RESET position.

   f. Place the LEVEL ALARM reset control switch to the NORMAL position.

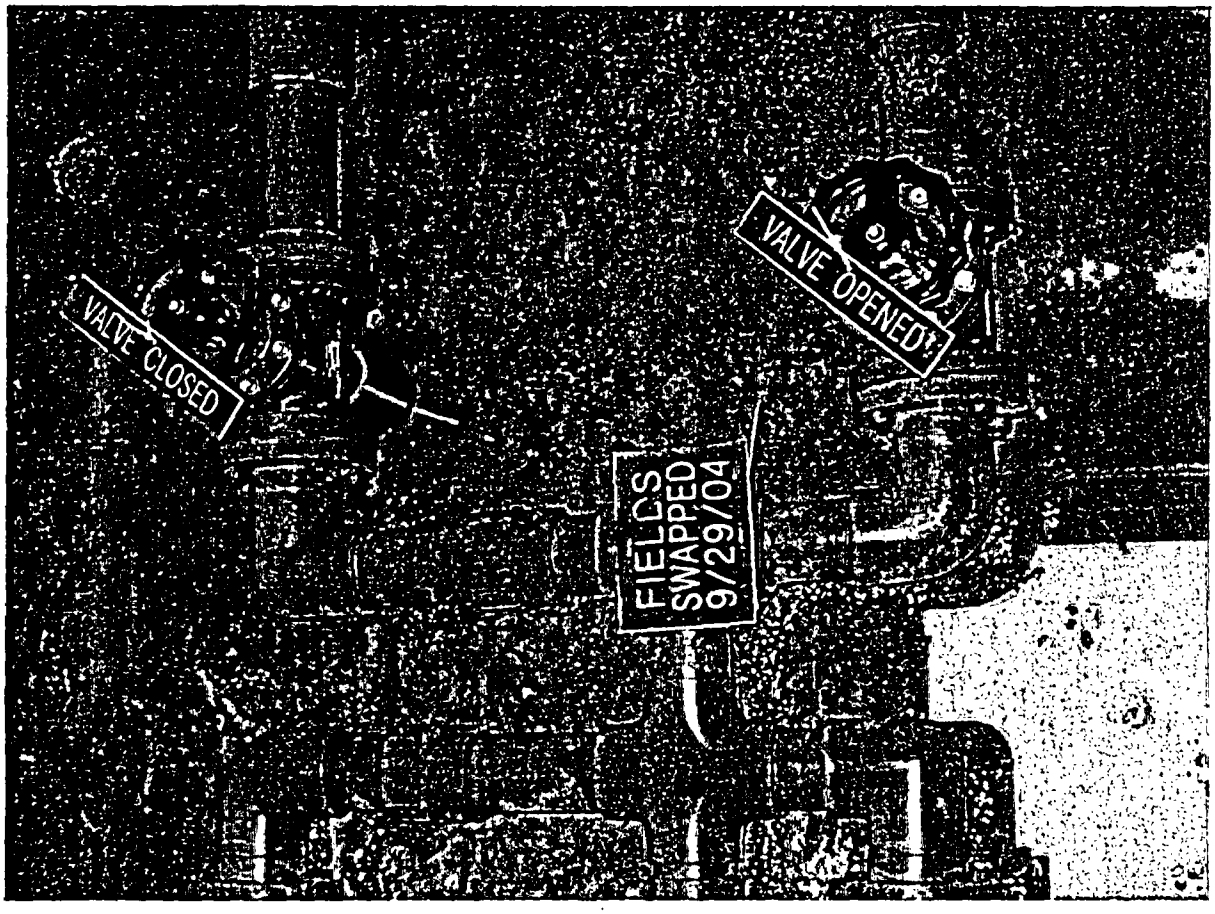
   g. Verify the HIGH level alarm light is extinguished.

Comments: BOTH FIELD 1 VALVE AND FIELD 2 VALVES INDICATE DUEL POSITION.

Performed By: DEREK L. YATES / Derek L. Yates, 5/12/2004 (Print/Sign, Date)

M SHERBURN / [signature], 5-12-04 (Print/Sign, Date)

Reviewed By: Ron Keith / [signature], 5-12-04 (Shift Manager (Print/Sign), Date)



New Engineering Office Building leachfield valve pit indicating the west field was placed in service on September 29, 2004.

ATTACHMENT 3

Summary of Effluent and Groundwater Monitoring Data 2000-2004

&

ATTACHMENT 4

Demonstration of Compliance with the Aquatic Biota Criteria

SUMMARY OF GROUNDWATER QUALITY MONITORING CONDUCTED FROM 2000 THROUGH 2004 UNDER VERMONT YANKEE'S INDIRECT DISCHARGE PERMIT ID 9-0036-2

30 JUNE 2005

SUMMARY OF GROUNDWATER QUALITY MONITORING CONDUCTED BETWEEN 2000 AND 2004 UNDER VERMONT YANKEE'S INDIRECT DISCHARGE PERMIT ID 9-0036-2

Prepared for
ENTERGY NUCLEAR VERMONT YANKEE, LLC
320 Governor Hunt Road
PO Box 157
Vernon, VT 05354

Prepared by
NORMANDEAU ASSOCIATES, INC.
25 Nashua Road
Bedford, NH 03110

R-18980.040
30 JUNE 2005

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Appendix A – Water Quality Monitoring Data

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Table 2. Groundwater Quality Monitoring Data ..... Appendix

1.0 INTRODUCTION

A Final Indirect Discharge Permit (IDP) ID-9-0036 was issued by the State of Vermont Agency of Natural Resources (VANR) to Entergy Nuclear Vermont Yankee, LLC (Vermont Yankee) on 26 June 2003. This IDP authorized the discharge of treated domestic sewage from subsurface and mounded disposal systems serving the Vermont Yankee Nuclear Power Plant into the groundwater and indirectly into the Connecticut River in the town of Vernon, Vermont. This IDP is an amendment to the prior permit and approves the connection of the Power Uprate Building to the Construction Office Building (COB) sewage disposal system and also approves the construction of a replacement disposal field for the COB system. It also requires several modifications to the leachfield operations, inspection requirements, and operations during plant outages.

Normandeau Associates, Inc. (Normandeau) submits this report on behalf of Vermont Yankee to satisfy Condition E5 of Vermont Yankee's IDP ID-9-0036-2. Condition E5 requires "By June 30, 2005, the permittee shall have a qualified water quality specialist submit an evaluation to the Secretary of all past effluent and groundwater quality data and determine what, if any, short or long term impacts there have been on groundwater quality. If chemical and biological monitoring of the receiving waters was conducted, the results of that monitoring shall also be evaluated." The previous report satisfying Vermont Yankee's IDP Condition E5 summarized groundwater and effluent chemistry data for the 1995 through 1999 period (Normandeau Associates, December 1999). Therefore, Normandeau has prepared the current report to summarize data for the 2000 through 2004 period. Please note that IDP ID-9-0036-2 required no chemistry monitoring activities during 2000 through 2005 in the Connecticut River. Vermont Yankee's NPDES permit #3-1199 required monthly water chemistry (copper, iron and zinc) and biological monitoring in the Connecticut River during the same period, and these results have shown no significant change in the resident and migratory fish and invertebrate communities in the vicinity of the plant. Annual NPDES monitoring data and results are presented in April or May following each year to the VANR at an annual Environmental Advisory Committee meeting, and are also presented to VANR in an annual report and are not presented here.

2.0 SEPTIC EFFLUENT AND GROUNDWATER MONITORING

2.1 SEPTIC EFFLUENT MONITORING

The water quality of Vermont Yankee's septic tank effluent was observed by sampling in accordance with IDP ID-9-0036-2 following the procedures in Normandeau's approved Quality Assurance/Quality Control Plan (Normandeau 2000). Effluent from four septic tanks (Main, COB, New Warehouse, and New Engineering Office Building) were sampled in April and October of each year 2000 through 2004. Figure 1 shows the location of the four septic tanks, leachfields, and the associated groundwater monitoring wells.

Five-day biochemical oxygen demand (BOD_5), chloride, total suspended solids (TSS), total phosphorus (Total P), total dissolved phosphorus (Dissolved P), pH, total Kjeldahl nitrogen (TKN), ammonia nitrogen (ammonia), nitrate, and nitrite were the effluent constituents examined from each sampling event as required by IDP ID-9-0036-2. Monitoring for NO3 and NO2 was replaced by monitoring for NO3/NO2 as N in 2003 in accordance with the permit. These septic tank effluent quality data are summarized in Table 1A through 1D, showing both the time series for each parameter

as obtained during the ten water quality sampling events conducted in April and October of 2000 through 2004 and in an additional monitoring event in August 2003 prior to spreading of residuals. In addition to presenting the data, a summary of the minimum, maximum and mean constituent concentrations among the sampling events is also provided. Please note that we used the detection limit when a minimum or mean concentration is calculated from a set of data with one or more values reported as less than the detection limit.

2.2 GROUNDWATER MONITORING

The water quality in Vermont Yankee's groundwater wells surrounding three leachfields was observed by sampling in accordance with IDP ID-9-0036-2 following the procedures in Normandeau's approved Quality Assurance/Quality Control Plan. If the wells were not found to be dry, groundwater samples were obtained in April and October of each year 2000 through 2004 and in an additional monitoring event in August 2003 prior to spreading of residuals. Figure 1 shows the location of the groundwater monitoring wells and the various leachfield systems.

Wells 1201, 1202, 1203, 1204, 1301R, 1302, 1302R and 1303 were sampled to evaluate the groundwater quality associated with the Main (north) leachfield system. Wells 2101, 2102, 3301, 3302, and 3401 were sampled to evaluate the groundwater quality associated with the COB and New Warehouse (South) leachfield system. Wells 6201, 6202, and 6203 were sampled to evaluate groundwater quality associated with the New Office Building leachfield system. Two new wells (221 and 221A) were added in the Fall of 2003 to evaluate the groundwater quality associated with the COB Alternative Leachfield, which also serves the new Plant Uprate Building. Sampling of these wells started 7 October 2003.

All groundwater wells found not to be dry were sampled and the water was analyzed for most of the constituents examined in the septic tank effluent (BOD_5, chloride, Dissolved P, pH, TKN, ammonia, nitrate, and nitrite) as required by IDP ID-9-0036-2. TSS and Total P were not analyzed from groundwater samples, but Escherichia coli (E-coli) was added to determine the effectiveness of disinfection of the septic tank effluent. In 2003, the groundwater monitoring requirements were modified such that BOD_5 was no longer tested and the methods for testing nitrogen were modified from testing for ammonia nitrogen, Nitrate (NO3), Nitrite (NO2) and Total Kjeldahl Nitrogen (TKN) to testing for Nitrate (as N). Also sampled in the groundwater wells is the depth to groundwater, which is presented as the depth below the ground surface. Weekly observations of groundwater elevation were reported in the semi-annual reports for the months of April and October of each year, and will not be presented here. Groundwater quality data are summarized in Tables 2A through 2R, which shows both the time series for each parameter as obtained during the eleven water quality sampling events conducted in 2000 through 2004, and a summary of the minimum, maximum and mean constituent concentrations among the sampling events. Please note that we used the detection limit when a minimum or mean concentration is calculated from a set of data with one or more values reported as less than the detection limit.

3.0 SEPTIC EFFLUENT AND GROUNDWATER QUALITY

The following paragraphs discuss the data obtained from septic tank effluent and groundwater monitoring at Vermont Yankee Nuclear Power Plant in Vernon, Vermont from April 2005 through October 1999 (Table 1, Table 2, and Appendix 1). Each constituent is discussed, with particular

reference to time series trends from 2000 through 2005. Comparison is also made between the observed maximum groundwater concentrations from the 2000 through 2005 monitoring results and VANR's current enforcement standards and preventive action levels (PALs) in Chapter 12 Groundwater Protection Rule and Strategy (Rule No. 97-P14, 15 November 1997).

3.1 BIOCHEMICAL OXYGEN DEMAND, 5-DAY (BOD_5)

Septic tank effluent BOD_5 ranged between a minimum of 2.2 mg/l and a maximum of 1550 mg/l over the five years of monitoring among all four septic tanks monitored (Table 1). The mean BOD_5 was 157 mg/l for the Main septic tank, 370 mg/l for the New Warehouse septic tank, 205 mg/l for the COB septic tank and 368 mg/l for the New Office Building septic tank. These values are typical of septic tank effluents. The time series shows very low values (2.2 to 2.6 mg/l) in all four tanks in October 2000, followed by average to very high values in the April 2001 samples. Indeed, two of the highest values recorded (1550 mg/l at the New Office Building and 1020 mg/l at the New Warehouse) were found during this sample event. Otherwise, the samples generally do not show such dramatic changes from sample date to sample date over the time series. There was no trend of increasing concentrations and in fact some of the lowest values in the 5-year period were found on the last sampling event of the period (October 2004).

Mean groundwater BOD_5 ranged from the method detection limit (<1 mg/l) to 17 mg/l among all wells monitored over the five-year period (Table 2), indicating a substantial reduction of effluent BOD_5. There was no trend of increasing groundwater degradation as indicated by the time series of BOD_5 data for individual wells. A BOD_5 of 17 mg/l observed at well 3301 in April 2001 was the highest groundwater BOD_5 observed; the date of this groundwater sample also corresponds to the date of the highest effluent BOD_5 observed. The second highest BOD_5 was 15 mg/l observed at the same well (3301) in the next sample event (October 2001). However, prior and subsequent samples at this well were below detection limits and no time series trend is evident. Well 3301 is located down-gradient from the South leachfield system which serves both the New Warehouse and COB septic tanks. All recorded values were well within the maximum acceptable change for indicator parameters of 25 mg/l shown for BOD_5 in Table 3 of the Chapter 12 Rule.

3.2 CHLORIDE

Mean septic tank effluent chloride concentrations were 120 mg/l for the Main septic tank, 148 mg/l for the New Warehouse tank, 145 mg/l for the COB tank, and 98 mg/l in the New Office septic tank over the 2000-2005 monitoring period (Table 1). The maximum chloride concentration was 152 mg/l for the Main septic tank (April 2003), 197 mg/l for the New Warehouse tank (also April 2003), 158 mg/l for the COB tank (October 2004), and 126 for the New Office tank (November 2004) during the monitoring period. There were no time series trends observed in chloride concentration in the Vermont Yankee septic tank effluent during the 2000-2004 monitoring period and most of the values recorded were not a significant departure from the mean values for each tank.

Mean groundwater chloride concentrations ranged from 2.5 mg/l (well 6202) up to 359 mg/l (well 3302, Table 2). The highest chloride concentration was observed at well 3302 (652 mg/l, October 2004). All of the high chloride records were from wells at the COB/New Warehouse system. The highest mean values were from wells 3302 and 2101. There was a general increasing trend in chloride concentrations at these two wells over the five years of monitoring. Chloride concentrations

in groundwater from well 3401 (down gradient from the South leachfield, mean of 69 mg/l) are significantly lower than from well 2101 (upgradient from the South leachfield, mean of 300 mg/l). It has been postulated in numerous 6-month water quality reports and in the 1999 5-year evaluation that the high chloride levels at the wells in the COB/New Warehouse system are due to their proximity to an access road which receives sand and salt during the winter months (Figure 1). The data from the current 5-year period appears to support this theory.

Chloride has an enforcement standard of 250 mg/l and a PAL of 125 mg/l as specified in Table 2 (Secondary Groundwater Standards) of the Chapter 12 Rule. For the Main leachfield system, only one exceedence of the enforcement standard (October 2002, well 1201) and one exceedence of the Pal (October 2004, well 1203) occurred during the monitoring period. As explained above, numerous exceedences of the enforcement standard were observed in the COB/New Warehouse system. No exceedences of either the enforcement standard or the PAL occurred in the New Office or Northwest leachfield systems.

3.3 TOTAL SUSPENDED SOLIDS (TSS)

Mean septic tank effluent TSS was 128 mg/l for the Main septic tank, 301 mg/l for the New Warehouse tank, 108 mg/l for the COB tank, and 626 mg/l for the New Office Building tank over the 2000-2004 monitoring period (Table 1). The maximum TSS was 330 mg/l for the Main septic tank (April 2000), 880 mg/l for the New Warehouse tank (also April 2000), 210 mg/l for the COB tank (again April 2000) and 6100 mg/l for the New Office tank (October 2000) during the monitoring period. The 6100 mg/l value for the New Office tank is orders of magnitude higher than the other values recorded in this tank in the monitoring period and may reflect the mixing of settled solids that were stirred up and collected with the effluent at the time of sampling. If this high value is considered an artifact of sampling and is not used to in the calculation, the maximum value for the tank during the monitoring period would be 128 mg/l and the mean would be 79 mg/l. This mean TSS concentration is dramatically lower than the calculated mean of 626 mg/l for the New Office building that include 6100 mg/l as a maximum value.

TSS was not observed in the groundwater samples, and there is no Chapter 12 Groundwater Protection Rule enforcement standard or PAL for TSS.

3.4 TOTAL PHOSPHORUS

Mean septic tank effluent Total P was 12.1 mg/l for the Main septic tank, 12.7 mg/l for the New Warehouse tank, 10.6 mg/l for the COB tank, and 13.5 for the New Office tank over the 2000-2004 monitoring period (Table 1). The maximum Total P was 24.6 mg/l for the Main septic tank, 29.8 mg/l for the New Warehouse tank, 18.9 mg/l for the COB tank and 28.3mg/l for the New Office tank. There was no time series trend of increasing Total P concentration in any of the septic tanks. The only apparent time series pattern was that the minimum or near minimum Total P concentrations were consistently observed in all four tanks during October 2001 and the maximum or near maximum concentrations were consistently observed in all four tanks during April 2000.

Groundwater concentrations of Total P were not observed. There is no Chapter 12 Groundwater Protection Rule enforcement standard or PAL for Total P.

3.5 DISSOLVED PHOSPHORUS

Mean septic tank effluent Dissolved P was 9.4 mg/l for the Main septic tank, 8.6 mg/l for the New Warehouse tank, 7.9 mg/l for the COB tank, and 9.5 for the New Office tank over the 2000-2004 monitoring period (Table 1). The maximum Dissolved P was 21.6 mg/l for the Main septic tank (October 2002), 20.5 mg/l for the New Warehouse tank (April 2003), 18.9 mg/l for the COB tank (October 2002) and 19.5 mg/l for the New Office tank (also October 2002). There was no time series trend of increasing Dissolved P concentration in any of the septic tanks. The only apparent time series pattern was that the minimum Dissolved P concentrations were consistently observed in all four tanks during April 2000, then values gradually increased in all four tanks to the maximum observed in the period in October 2002 or April 2003, then a marked decrease for August 2003 and October 2003 samples, followed by an increase for April 2004 and October 2004 samples.

Groundwater concentrations of dissolved P show substantial reduction when the effluent enters the groundwater. Mean groundwater concentrations of Dissolved P were from 0.04 mg/l to 0.99 mg/l over the 2000-2004 monitoring period (Table 2). The maximum Dissolved P was 4.20 mg/l observed in well 1302R during the April 2001 sampling event. Nearly all of the Dissolved P concentrations for Vermont Yankee's groundwater monitoring wells were below 1.00 mg/l and many were below the detection limit. There was no time series trend of increasing Dissolved P concentration in any of the wells, or any overall pattern of elevated concentrations in down gradient wells compared to upgradient wells.

There is no Chapter 12 Groundwater Protection Rule enforcement standard or PAL for Dissolved P.

3.6 pH

Mean septic tank effluent pH was 7.5 standard units for the Main septic tank, 7.8 for the New Warehouse tank, 7.4 for the COB tank, and 7.3 for the New Office tank over the 2000-2004 monitoring period (Table 1). These are all reasonable values for septic tank effluent and similar to values reported in the previous two permit periods (Inchcape 1994 and Normandeau 1999). In April 2004, the maximum or second highest pH was observed in all four systems for the entire five-year period; 8.1 for the Main septic tank, 8.6 for the New Warehouse tank, 7.9 for the COB tank, and 7.5 for the New Office tank (the maximum for the New Office tank of 7.6 was observed in the subsequent sample event in November 2004). There was no time series trend of increasing or decreasing pH in any of the septic tanks.

Mean groundwater pH ranged from 4.9 to 7.1 standard units, while maximum groundwater pH ranged from 6.1 to 10.0 standard units and minimum pH ranged from 4.2 to 6.8 standard units (Table 2). Monitoring well 2101 (upgradient of the South leachfield) was reported to have the lowest pH during the previous two monitoring periods (Inchcape 1994 and Normandeau 1999). During the current five-year monitoring period, this well had the second lowest mean pH (5.5 SU), second only to well 1302R (mean pH 4.9 SU).

Table 3 of the Chapter 12 Rule presents a maximum acceptable change of 1 standard pH unit over the monitoring period. If this rule is applied to all observations within the 2000-2004 five-year time series of pH values for each well, changes of more than 1 pH unit were observed at the following wells: 1201, 1203, 1204, 1302R, 2101, 6201 and 6203. A similar observation for nearly the same set of well was made in the previous five-year report (Normandeau 1999) and changes of more than 1 pH unit

were also observed in the 1994 report (Inchcape 1994). The conclusion in the 1999 report also seems to apply to the data for the 2000-2004 five-year analysis period: either the variability in point source measurements taken in the field is great, or the Chapter 12 maximum acceptable change of 1 pH unit is unrealistic.

3.7 Total Kjeldahl Nitrogen (TKN)

Mean septic tank effluent TKN was 192 mg/l for the Main septic tank, 342 mg/l for the New Warehouse tank, 295 mg/l for the COB tank, and 368 for the New Office tank over the 2000-2004 monitoring period (Table 1). These are relatively high TKN concentrations for septic tank effluent and are somewhat higher than the TKN concentrations reported for the previous two permit periods (Inchcape 1994 and Normandeau 2000). The maximum TKN was 260 mg/l for the Main septic tank (April 2004), 871 mg/l for the New Warehouse tank (April 2002), 740 mg/l for the COB tank (April 2000), and 1010 mg/l for the New Office tank (April 2000). There was no time series trend of increasing TKN in any of the septic tanks over the five-year monitoring period, in fact the lowest or near lowest values were observed for each tank on the last sampling event of the period. The only apparent time series pattern was that the maximum TKN concentrations were observed in three of the four tanks during April 2000.

Groundwater concentrations show a substantial reduction in TKN compared with the septic tank effluent. Maximum groundwater TKN concentrations ranged 0.19 mg/l (well 1204, April 2002) to 272 mg/l (well 1303 during October 2000). However, all values recorded within the entire five-year period were below 10 mg/l with the exception of two samples (well 1303, October 2000 [272 mg/l] and well 1301R, October 2000 [95 mg/l]. Mean groundwater TKN ranged from 0.12 mg/l, (well 1204) up to 68.14 mg/l (well 1303, Table 2). Without the unusually high maximum value of 272 mg/l noted above, the mean for this well would be 0.18 mg/l, rather than 68.14. There was no significant time series trend of increasing TKN in any of Vermont Yankee's groundwater monitoring wells over the five-year monitoring period.

TKN sampling for groundwater was replaced with sampling for NO3/NO2 as N in 2003. There is no Chapter 12 Groundwater Protection Rule enforcement standard or PAL for TKN.

3.8 AMMONIA NITROGEN

Mean septic tank effluent ammonia concentrations were 163 mg/l for the Main septic tank, 202 mg/l for the New Warehouse tank, 146 mg/l for the COB tank, and 138 mg/l for the New Office tank over the 2000-2004 monitoring period (Table 1). These mean ammonia concentrations are relatively high for septic tank effluent as was also observed for TKN, and are somewhat higher than values reported in the previous two permit periods (Inchcape 1994 and Normandeau 1999). The maximum ammonia concentration was 208 mg/l for the Main septic tank (April 2004), 360 mg/l for the New Warehouse tank (April 2002), 194 mg/l for the COB tank (also April 2002) and 191 mg/l for the New Office tank (April 2004). In comparing the ammonia and TKN concentrations observed in each septic tank effluent, it is quite possible that most of the TKN is ammonia, as opposed to organic nitrogen, which is probably the result of anaerobic degradation of organic nitrogen in the tanks. There was no time series trend of increasing ammonia or any other apparent time series pattern in any of the septic tanks over the five-year monitoring period.

Groundwater concentrations show a substantial reduction in ammonia compared with the septic tank effluent. Mean groundwater ammonia concentrations ranged from 0.06 mg/l (well 1201) up to 4.90 mg/l(well 3301, Table 2). Maximum groundwater ammonia concentrations ranged from 0.10 mg/l, (wells 1201, 1204 and 1303) to 7.4 mg/l (well 2101 during April 2004). There was no correlation of increased values in the down gradient wells compared to their corresponding upgradient wells. There was no time series trend of increasing ammonia concentrations in any of Vermont Yankee's groundwater monitoring wells over the five-year monitoring period.

Ammonia nitrogen analysis for groundwater was replaced with analysis for NO3/NO2 as N in 2003. There is no Chapter 12 Groundwater Protection Rule enforcement standard or PAL for ammonia nitrogen.

3.9 NITRATE NITROGEN

Mean septic tank effluent nitrate concentrations were 0.03 mg/l for the Main septic tank, 0.04 mg/l for the New Warehouse tank, 0.02 mg/l for the COB tank, and 0.13 mg/l for the New Office tank over the 2000-2004 monitoring period (Table 1). These nitrate concentrations confirm that the septic tank effluent is anaerobic, with no significant nitrification occurring in the septic tanks. The maximum nitrate concentration was 0.05 mg/l for the Main septic tank (April 2000), 0.09 mg/l for the New Warehouse tank (also April 2000), 0.04 mg/l for the COB tank (also April 2000), and 0.50 mg/l for the New Office tank (April 2001). There was no time series trend of increasing or decreasing nitrate in any of the septic tanks over the five-year monitoring period. Most values observed in the monitoring period were below the detection limit (0.020 mg/l).

Groundwater concentrations generally show a substantial increase in nitrate concentrations due to nitrification of ammonia, compared with the septic tank effluent. Mean groundwater nitrate concentrations ranged from 0.03 mg/l (well 3301), to 33.15 mg/l (well 1302R, Table 2). Maximum groundwater nitrate concentrations ranged from a low of 0.06 mg/l (well 3301, October 2000) to a high of 45.5 mg/l(well 1302R, April 2000). Well 1302R also exhibited two additional high nitrate concentrations (41.0 mg/l October 2000 and 40.8 mg/l April 2001). The monitoring wells with the highest concentrations of nitrates were 1204 and 1302R; both are down gradient wells from the Main leachfields. The time series pattern shows decreasing nitrate concentrations at well 1302R. No other time series trends of increasing or decreasing nitrate concentrations were apparent in any of the other Vermont Yankee groundwater monitoring wells over the five-year monitoring period.

Nitrate has an enforcement standard of 10 mg/l and a PAL of 5 mg/l as the primary groundwater quality standards in Table 1 of VANR's Chapter 12 Groundwater Protection Rule. A total of 26 samples were found to have groundwater nitrate concentrations in excess of the current PAL over the monitoring period, which was from April 2000 to October 2003. Wells 1204, 1302, 1302R, 1303, 2101, 3401, 6201, 6202, 221, and 221A have all had one or more semi-annual observations of groundwater nitrate concentrations in excess of the current PAL. In addition, groundwater nitrate concentrations in 10 samples were observed to be above the current enforcement standard (wells 1204, 1302, 1302R, 1303, 6201 and 6202). Elevated levels of Nitrate have been reported in the summary reports for the previous two permit periods and so it appears that the values observed in the current period continue the trend for occasional exceedences of the PAL and enforcement standard.

3.10 NITRITE NITROGEN

Mean septic tank effluent nitrite concentrations were 0.03 mg/l for the Main septic tank, 0.04 mg/l for the New Warehouse tank, 0.02 mg/l for the COB tank, and 0.03 mg/l for the New Office tank over the 2000-2004 monitoring period (Table 1). These nitrite concentrations corroborate the existence of anaerobic conditions in the septic tanks. The maximum nitrite concentration was 0.041 mg/l for the Main septic tank (April 2000), 0.96 mg/l for the New Warehouse tank (also April 2000), 0.033 mg/l for the COB tank (also April 2000), and 0.51 mg/l for the New Office tank (also April 2000). All values observed, except those noted above on April 2000, were below the detection limit. There was no time series trend of increasing or nitrite in any of the septic tanks over the five-year monitoring period.

Groundwater monitoring results generally show a low concentration of nitrite because most of the inorganic nitrogen is in the form of nitrate due to nitrification of ammonia. Mean groundwater nitrite concentrations ranged from around the method detection limits (0.02 mg/l) observed at many of the wells to 0.05 mg/l at well 3302 (Table 2). Maximum groundwater nitrite concentrations ranged from a low of less than the method detection limits (< 0.02 mg/l) observed at many of the wells to a high of 0.056 mg/l at well 3302 (April 2001). Nearly all of the samples had very low concentrations and most were below the detection limit. However, two relatively high nitrite values were observed in monitoring well 3302 (down-gradient of the COB and New Warehouse leachfields). This well showed consistently elevated in nitrite concentrations relative to the other wells in the previous (1994-1999) monitoring period.

There were no apparent time series trends of increasing or decreasing nitrite concentrations in any of the Vermont Yankee's groundwater monitoring wells over the 2000-2004 five-year monitoring period.

Nitrite has an enforcement standard of 1 mg/l and a PAL of 0.5 mg/l as the primary groundwater quality standards in Table 1 of VANR's Chapter 12 Groundwater Protection Rule. With the exception of the two high nitrite concentration at well 3302 (0.056 mg/l April 2001 and 0.051 mg/l October 20002) and on high value in well 3301 (0.054 mg/l April 2000), all of Vermont Yankee's groundwater nitrite concentrations were less than the enforcement standard and less than the PAL.

3.11 NO3/NO2 AS N

Mean septic tank effluent NO3/NO2 as N concentrations were 0.07 mg/l for the Main septic tank, 0.03 mg/l for the New Warehouse tank, 0.06 mg/l for the COB tank, and 0.05 mg/l for the New Office tank over the 2000-2004 monitoring period (Table 1). The maximum N concentration was 0.24 mg/l for the Main septic tank (October 2004), 0.075 mg/l for the New Warehouse tank (October 2004), 0.22 mg/l for the COB tank (October 2001), and 0.097 mg/l for the New Office tank (April 2002). Most values observe were below the detection limit of .020 mg/l. There was no time series trend of increasing or N in any of the septic tanks over the five-year monitoring period.

N has an enforcement standard of 10 mg/l and a PAL of 5 mg/l as the primary groundwater quality standards in Table 1 of VANR's Chapter 12 Groundwater Protection Rule. Several wells had values exceeding these limits, including 1204 (35 mg/l April 2004 and 5.1 mg/l October 04), 1302R (20 mg/l April 2004)3401 (5.9 mg/l April 2004 and 10.6 mg/l October 2004), 221 (6.8 mg/l April 2004 and 17.6 mg/l October 2004). Vermont Yankee has only been monitoring for NO3/NO2 as N since April

2004, so there are relatively few data points in the 2000-2004 five-year monitoring period. There were no apparent time series trends of increasing or decreasing N concentrations in any of the Vermont Yankee's groundwater monitoring wells over the 2000-2004 five-year monitoring period.

3.12 ESCHERICHIA COLI

Escherichia coli were detected in at least one sampling event in nearly all of the Vermont Yankee groundwater wells during the 2000-2004 monitoring period (Table 2). This is a departure from the previous monitoring period where E. coli was detected in 6 wells but only during one sampling event (April 1996). Overall, E. coli was detected in 24 samples during the monitoring period. Bacteria Total Coliform has an enforcement standard and a PAL "Absent" as specified in Table 1 of the Chapter 12 Rule.

Most of the detections, and the highest concentrations, were found in the wells down gradient of the New Office building. Values above the detection limit (>2,420 colonies/100 ml) were observed at well 6202 in April 200 and August 2003 and a high value of 461 colonies/100 ml was observed in October 2003. Of the 11 sampling events for this well, E. coli was detected in 7 samples. A value above the detection limit was also observed in well 6203 in August 2003 and a high value of 225 colonies/100 ml was observed in October 2003. Of the 10 samples obtained from this well, E. coli was detected in 5 samples. E. coli was detected in high numbers at both wells in August 2003 and October 2004 and other samples from these wells showed detectable levels, but without any evident time series trend. There were no apparent time series trends of increasing or decreasing E. coli concentrations in any of the other Vermont Yankee's groundwater monitoring wells over the 2000-2004 five-year monitoring period.

There is not sufficient information present to identify the cause of these exceedences, however, it is suggested that Vermont Yankee consider the following potential actions:

- Vermont Yankee could consider modifying the sampling protocol to obtain duplicate samples to determine if either field or lab techniques should be modified.
- Vermont Yankee could consider replacing the monitoring wells at the New Office building leachfield. The current wells are PVC pipes impact-driven into the ground, and may be affected to bacteria contaminated surface water. The wells could be replaced with engineered groundwater wells that are sealed and contain a gravel pack, as with the new wells in the COB replacement leachfield.
- If implementing the actions above does not provide resolution within the next five-year analysis period, Vermont Yankee could consider evaluating the design elements of the septic tank and leachfield to determine if the characteristics are appropriate for current and future uses of the New Office building. It is noted that in each annual inspection of the New Office septic tank since it was placed in operation, significant accumulations of sludge and scum have been found in the inlet side of the tank, resulting in the recommendation to pump the tank each year.

3.13 DEPTH TO GROUNDWATER

The depth to groundwater in the Vermont Yankee monitoring wells ranged between 3.6 and 29.3 feet below grade during the 2000-2004 monitoring period (Table 2). The New Office monitoring wells (6201, 6202, and 6203) have the shallowest mean depth to groundwater (5.8 ft to 6.9 ft) relative to the other leachfield systems. This is due to the fact that these wells are situated in an area were bedrock is encountered at a relatively shallow depth below the ground surface. The Northwest leachfield system (wells 221 and 221A) also has shallow depths to groundwater (mean values between 8.6 ft and 9.7 feet). The mean depth to groundwater for wells in the other systems ranged from 10.0 ft (well 2101) to 20.48 ft (well 1303) below grade. Wells 1202 and 2102 were consistently dry during all monitoring events.

3.14 COMPLIANCE WITH AQUATIC PERMITTING CRITERIA

Normandeau has reviewed the septic effluent and groundwater data and prepared a summary table (Table A) which demonstrates that septic effluent discharged into the groundwater under Vermont Yankee's Indirect Discharge Permit (IDP) ID-9-0036-2 was in compliance with the Aquatic Permitting Criteria of the IDP for the monitoring period from 2000 through 2004. Our analysis was performed under worst case conditions, using a dilution ratio of 31,870:1 (stream flow:effluent flow) based on 7Q10 Connecticut River flows and maximum effluent discharge flows during outages as provided in Condition A1 of the IDP (note the narrative found in Condition B2 for the dilution ratios is not in agreement with the values in Condition A1. Also, the Normal Operational Flow Capacity in Condition B2 should be 14,347 gpd, not 4,347). The analysis was also conservative because we assumed that parameter concentrations observed in the down gradient wells will receive no further mixing and dilution, and that all of the septic discharge flow enters the Connecticut River. The mean discharge concentration for each parameter was derived from observations taken during semi-annual monitoring (April and October) from 2000 through 2004 among the following down gradient monitoring wells: 1301R, 1302, 1302R, 3301, 3302, 3401, 6202 and 6203. Surface water monitoring was not required or performed during the 2000 through 2004 permit period, therefore the upstream concentrations of surface water quality parameters were based on the mean of 14 observations in the Connecticut River as provided in Condition B2 of the 22 April 1998 IDP. The Connecticut River flow was so great compared to the maximum effluent flow that Vermont Yankee's IDP discharge was undetectable and well within the Indirect Discharge Rules Limit Concentrations for the parameters shown in Condition B2 of the IDP. The mean discharge concentrations would have to be at least an order of magnitude higher than were observed to even detect the contribution of Vermont Yankee's septic effluent to the Connecticut River.

Table A. Comparison of regulated parameters discharged from septic disposal and leachfield systems operated by Vermont Yankee during 2000 through 2004 under Vermont Indirect Discharge Permit ID-9-0036-2.

Parameter	Discharge Flow (gpd)	Mean Discharge Concentration (mg/l)	Mean Upstream Concentration (mg/l)	Calculated Downstream Concentration (mg/l)	IDR Limit Concentration (mg/l)
TDP	30,904	0.401	0.010	0.010	0.011
NO3	30,904	7.133	0.308	0.308	2.0
TKN	30,904	4.363	0.468	0.468	3.0
NO2	30,904	0.063	0.005	0.005	0.02
NH3	30,904	0.840	0.045	0.045	0.85
BOD5	30,904	3.986	1.32	1.320	2.0

Effluent discharge flows (gpd): normal operations = 14,347 gpd, outage operations = 30,904 gpd

Connecticut River Low Median Monthly Flow (gpd, est.) = 1971129600
and 7Q10 Flow (gpd, est) = 984918500

Dilution Ratios (stream flow/effluent flow):

Normal operations at LMM: 137390
Normal operations at 7Q10: 68650

Outage operations at LMM: 63,782
Outage operations at 7Q10: 31,870

Calculated downstream concentration = (mean discharge concentration/31,870) + mean upstream concentration

4.0 SUMMARY

The Vermont Yankee septic tank effluent samples observed from 2000 through 2004 indicate that the septic tanks are producing effluent of typical quality, although somewhat high in nitrogen (TKN, ammonia, and NO3/NO2 as N) content. Groundwater monitoring wells showed substantial reductions in biodegradable or absorbable constituents, although there were numerous instances of the presence of the human pathogenic bacterium, Escherichia coli.

Observed groundwater concentrations of the parameters observed during the five-year monitoring period are generally less than both the enforcement standards and the PAL's for parameters shown in the groundwater quality standards of VANR's Chapter 12 Groundwater Protection Rule. No

monitoring well appears consistently impacted over time in terms of the majority of the parameters monitored. A number of wells are elevated in chloride, plausibly due to the spreading of salt on nearby access roads for snow and ice control. The data for this monitoring period show several wells with high bacteria counts. It is recommended that Vermont Yankee should investigate the cause of these high values and implement a plan to reduce the bacteria.

5.0 REFERENCES

Inchcape Testing Services, December 1994. Summary of Water Quality Monitoring conducted under Vermont Yankee's Indirect Discharge Permit ID-9-0036.

Normandeau Associates Inc, December 1999. Summary of Groundwater Quality Monitoring conducted between 1995 and 1999 under Vermont Yankee's Indirect Discharge Permit ID-9-0036.

Normandeau Associates Inc. October 2000. Vermont Yankee Nuclear Power Corp. Indirect Discharge Permit ID-9-0036-2 Quality Assurance/Quality Control Plan. Revision 4, Change 0, 1 October 2000.

APPENDIX

Water Quality Monitoring Data

Table 1A. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Septic Effluent Quality Data for Samples Collected at the Main System

	Main Septic System Effluent													
Date	4-Apr-00	3-Oct-00	10-Apr-01	11-Oct-01	16-Apr-02	5-Oct-02	15-Apr-03	7-Aug-03	28-Oct-03	13-Apr-04	20-Oct-04			
PARAMETER (mg/l unless noted)												Min	Max	Mean
Biochemical Oxygen Demand - 5	140	2.6	165	104	121	147	217	86	340	307	98	2.6	340	157.1
Chloride	102	98	114	105	112	133	152	110	123	145	126	97.9	152	120.0
Total Suspended Solids	330	140	37	117	69	101	218	73	57	115	156	37	330	128.4
Total Phosphorus	15.0	2.7	3.2	2.4	13.2	24.6	21.2	7.1	2.9	23.3	17	2.4	24.6	12.1
Dissolved Phosphorus	1.6	2.8	2.2	2.6	13.0	21.6	19.3	5.7	2.1	17.2	15.7	1.6	21.6	9.4
pH (standard units)	7.4	7.4	7.5	7.5	7.6	7.6	7.3	7.3	7.3	8.1	7.3	7.3	8.1	7.5
Nitrate Nitrogen (NO3)	0.049	<0.020	<0.020		0.040	<.020	0.021					0.02	0.049	0.03
Nitrate/Nitrite as N				0.028				0.023	<0.02	0.03	0.24	0.02	0.24	0.07
Nitrite Nitrogen (NO2)	0.041	<0.020	<0.020				<0.020					0.02	0.041	0.03
Total Kjeldahl Nitrogen	60	95	254	258	178	201	223	181	231	260	173	59.5	260	192.1
Ammonia Nitrogen (NH3-N)	141	154	180	110	116	175	173	186	197	208	154	110	208	163.1

Table 1B. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Septic Effluent Quality Data for Samples Collected at the New Warehouse System

Date	New Warehouse Septic System Effluent														
	4-Apr-00	2-Oct-00	9-Apr-01	10-Oct-01	16-Apr-02	5-Oct-02	15-Apr-03	7-Aug-03	27-Oct-03	27-Feb-04	14-Apr-04	6-Oct-04			
PARAMETER (mg/l unless noted)													Min	Max	Mean
Biochemical Oxygen Demand - 5	190	2.4	1020	657	780	173	550	167	371	215	234	77	2.4	1020	369.7
Chloride	146	146	144	139	136	145	197	117	124	196	167	116	116	197	147.8
Total Suspended Solids	880	720	74.4	209.0	253.0	78.0	183.0	299.0	804.0	83.8	83	62	62	880	310.8
Total Phosphorus	29.8	3.2	3.6	2.3	13.6	23.6	23.1	7.5	2.5	3.3	25.2	14.2	2.3	29.8	12.7
Dissolved Phosphorus	<0.5	1.8	3.6	2.4	12.8	19.3	20.5	5.8	1.8	3.2	19.1	12.9	0.5	20.5	8.6
pH (standard units)	7.7	7.2	7.9	7.4	7.8	8.2	7.8	7.5	7.7	8.0	8.6	7.7	7.2	8.6	7.8
Nitrate Nitrogen (NO3)	0.091	<0.020	<0.020		0.061	<.020	0.049						0.02	0.091	0.04
Nitrate/Nitrite as N				0.020				<0.020	<0.02	0.024	0.075	0.025	0.02	0.075	0.03
Nitrite Nitrogen (NO2)	0.096	<0.020	<0.020				<0.020						0.02	0.096	0.04
Total Kjeldahl Nitrogen	859	300	206	490	871	207	231	203	461	171	271	151	151	871	368.4
Ammonia Nitrogen (NH3-N)	190	130	283	182	360	194	184	198	199	174	202	130	130	360	202.2

Table 1C. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Septic Effluent Quality Data for Samples Collected at the Construction Office Building System.

	COB Septic System Effluent													
Date	4-Apr-00	2-Oct-00	9-Apr-01	10-Oct-01	16-Apr-02	5-Oct-02	15-Apr-03	7-Aug-03	27-Oct-03	14-Apr-04	6-Oct-04			
PARAMETER (mg/l unless noted)												Min	Max	Mean
Biochemical Oxygen Demand - 5	180	2.2	203	168	609	169	178	136	160	387	62	2.2	609	204.9
Chloride	123	115	157	135	156	155	155	144	157	139	158	115	158	144.9
Total Suspended Solids	210	70	17.7	199.0	90.0	140.0	69.0	58.4	131.0	162	41	17.7	210	108.0
Total Phosphorus	18.6	2.4	3.5	2.3	12.0	18.9	13.5	7.6	2.9	18.5	16.6	2.3	18.9	10.6
Dissolved Phosphorus	1.8	4.1	3.3	2.3	11.4	15.8	12.2	5.8	2.3	12.3	15.4	1.8	15.8	7.9
pH (standard units)	7.1	7.3	7.0	7.3	7.7	7.6	7.5	7.4	7.6	7.9	7.3	7	7.9	7.4
Nitrate Nitrogen (NO3)	0.044	<0.020	<0.020		0.020	<.020	<0.020					0.02	0.044	0.02
Nitrate/Nitrite as N				0.220				<0.020	<0.02	<0.02	<0.02	0.02	0.22	0.06
Nitrite Nitrogen (NO2)	0.033	<0.020	<0.020				<0.020					0.02	0.033	0.02
Total Kjeldahl Nitrogen	740	150	184	336	502	156	145	256	409	179	187	145	740	294.9
Ammonia Nitrogen (NH3-N)	123	102	189	78.3	194	157	112	164	185	135	171	78.3	194	146.4

Table 1D. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Septic Effluent Quality Data for Samples Collected at the New Engineering Office Building

	New Office Bldg Septic System Effluent													
Date	4-Apr-00	3-Oct-00	10-Apr-01	11-Oct-01	16-Apr-02	5-Oct-02	15-Apr-03	7-Aug-03	23-Oct-03	13-Apr-04	11/01/04*			
PARAMETER (mg/l unless noted)												Min	Max	Mean
Biochemical Oxygen Demand - 5	170	2.6	1550	663	51	177	196	305	270	371	296	2.6	1550	368.3
Chloride	108	92	105	59.4	51.2	114	99.6	88.9	110	119	126	51.2	126	97.6
Total Suspended Solids	96	6100	46.8	123	52.7	117	103	68.6	25.9	82	71	25.9	6100	626.0
Total Phosphorus	28.3	3.4	2.9	2.2	7.9	23.1	16.2	17.4	4.2	22.9	19.6	2.2	28.3	13.5
Dissolved Phosphorus	1.4	2.7	3.0	2.1	7.3	19.5	15.7	13.0	2.6	19	17.9	1.4	19.5	9.5
pH (standard units)	7.3	7.0	7.2	7.3	7.4	7.2	7.4	7.1	7.3	7.5	7.6	7	7.6	7.3
Nitrate Nitrogen (NO3)	0.069	<0.020	0.500			<.020	0.057					0.02	0.5	0.13
Nitrate/Nitrite as N				<0.020	0.097			0.026	0.051	0.042	0.038	0.02	0.097	0.05
Nitrite Nitrogen (NO2)	0.051	<0.020	<0.020				<0.020					0.02	0.051	0.03
Total Kjeldahl Nitrogen	1010	151	258	252	119	169	156	157	864	232	194	119	1010	323.8
Ammonia Nitrogen (NH3-N)	137	150	160	100	70	137	134	126	153	191	160	70	191	138.0

Table 2A. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 1201.

Well 1201 is in the Old Main (North) Leachfield System on the West

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max.Acceptable Change
Biochemical Oxygen Demand	NS	NS	NS	3.0	NS	<1.0	9.00					1.00	9.00	4.33			25
Chloride	NS	NS	NS	29.0	NS	464.00	90.10			39.7		29.00	464.00	155.70	250	125	
Dissolved Phosphorus	NA	NA	NA	<0.050	NS	1.86	0.64			0.043		0.04	1.86	0.65			
pH (standard units)	NA	NA	NA	6.8	NS	4.2	6.20			6.7		4.20	6.80	5.98			1 pH
Nitrate Nitrogen (NO3)	NS	NS	NS	2.8	NS	2.50	3.20					2.50	3.20	2.83	10	5	
Nitrite Nitrogen (NO2)	NS	NS	NS	<0.020	NS	<0.020	<0.020					0.02	0.02	0.02	1	0.5	
NO3/NO2 as N										2.6		2.60	2.60	2.60	10	5	
Total Kjeldahl Nitrogen	NS	NS	NS	0.54	NS	0.11	4.69					0.11	4.69	1.78			
Ammonia Nitrogen (NH3-N)	NS	NS	NS	<0.10	NS	<0.030	0.04					0.03	0.10	0.06			
E. Coli (CFU/100ml)	NS	NS	NS	<1	NS	1.00	<1.0			<1		1.00	1.00	1.00	Absent	Absent	
Depth to groundwater (ft)	19.28	19.23	NS	19.7	19.96	23.48	19.13			19.68		19.13	23.48	20.07			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2B. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 1202.

Well 1202 is in the Old Main (North) Leachfield System on the West

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max.Acceptable Change
Biochemical Oxygen Demand	NS	NS	NS	NS			NS					0.00	0.00	0.00			25
Chloride	NS	NS	NS	NS								0.00	0.00	0.00	250	125	
Dissolved Phosphorus	NA	NA	NA	NA								0.00	0.00	0.00			
pH (standard units)	NA	NA	NA	NA								0.00	0.00	0.00			1 pH
Nitrate Nitrogen (NO3)	NS	NS	NS	NS								0.00	0.00	0.00	10	5	
Nitrite Nitrogen (NO2)	NS	NS	NS	NS								0.00	0.00	0.00	1	0.5	
NO3/NO2 as N												0.00	0.00	0.00	10	5	
Total Kjeldahl Nitrogen	NS	NS	NS	NS								0.00	0.00	0.00			
Ammonia Nitrogen (NH3-N)	NS	NS	NS	NS								0.00	0.00	0.00			
E. Coli (CFU/100ml)	NS	NS	NS	NS								0.00	0.00	0.00	Absent	Absent	
Depth to groundwater (ft)	Dry	NS*	NS	Dry	Dry	Dry	Dry					0.00	0.00	0.00			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2C. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 1203.

Well 1203 is in the Old Main (North) Leachfield System on the East

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max.Acceptable Change
Biochemical Oxygen Demand	NS	NS	NS	NS	1.00	<1.0	NS					1.00	1.00	1.00			25
Chloride	NS	NS	NS	NS	51.50	31.40		64.80	72.20	60.5	177	31.40	177.00	76.23	250	125	
Dissolved Phosphorus	NA	NA	NA	NA	0.69	0.04		0.04	0.13	0.411	0.021	0.04	0.69	0.26			
pH (standard units)	NA	NA	NA	NA	6.50	6.5		10.00	7.20	6	6	6.00	10.00	7.03			1 pH
Nitrate Nitrogen (NO3)	NS	NS	NS	NS	2.10	2.30		3.60	4.10			2.10	4.10	3.03	10	5	
Nitrite Nitrogen (NO2)	NS	NS	NS	NS	<0.020	<0.020						0.02	0.02	0.02	1	0.5	
NO3/NO2 as N										3.3	5.1	3.30	5.10	4.20	10	5	
Total Kjeldahl Nitrogen	NS	NS	NS	NS	0.70	0.51						0.51	0.70	0.60			
Ammonia Nitrogen (NH3-N)	NS	NS	NS	NS	0.15	0.08						0.08	0.15	0.11			
E. Coli (CFU/100ml)	NS	NS	NS	NS	<1.0	<1.0		9.00	19.00	<1	1	1.00	19.00	5.33	Absent	Absent	
Depth to groundwater (ft)	19.76	19.59	NS	NS	20.41	23.94	19.44	19.64	19.24	19.84	19.14	19.14	23.94	20.11			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2D. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 1204.

Well 1204 is in the Old Main (North) Leachfield System on the East

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max Acceptable Change
Biochemical Oxygen Demand	NS	NS	NS	NS	2.00	<1.0	NS					1.00	2.00	1.50			25
Chloride	NS	NS	NS	NS	34.20	31.10		51.80	39.00	44.9	26.6	26.60	51.80	37.93	250	125	
Dissolved Phosphorus	NA	NA	NA	NA	<0.05	0.02		0.01	0.16	0.017	0.007	0.01	0.16	0.04			
pH (standard units)	NA	NA	NA	NA	6.50	5.3		8.40	6.90	4.5	4.8	4.50	8.40	6.07			1 pH
Nitrate Nitrogen (NO3)	NS	NS	NS	NS	34.60	7.90		5.90	16.40			5.90	34.60	16.20	10	5	
Nitrite Nitrogen (NO2)	NS	NS	NS	NS	<0.020	<0.020						0.02	0.02	0.02	1	0.5	
NO3/NO2 as N										35	5.1	5.10	35.00	20.05	10	5	
Total Kjeldahl Nitrogen	NS	NS	NS	NS	0.19	<0.040						0.04	0.19	0.12			
Ammonia Nitrogen (NH3-N)	NS	NS	NS	NS	0.10	<0.030						0.03	0.10	0.07			
E. Coli (CFU/100ml)	NS	NS	NS	NS	<1.0	<1.0		<1.00	<1.0	<1	<1	1.00	1.00	1.00	Absent	Absent	
Depth to groundwater (ft)	18.65	23.43	NS	NS	19.20	23.23	18.28	18.53	18.03	18.53	18.03	18.03	23.43	19.55			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2E. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 1301R.

Well 1301R is in the New Main (North) Leachfield System

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max Acceptable Change
Biochemical Oxygen Demand	<1.0	1.1	12.0	NS		2.00	NS					1.00	12.00	4.03			25
Chloride	20.3	33.2	27.1	NS		38.50				41.9		20.30	41.90	32.20	250	125	
Dissolved Phosphorus	0.23	<0.05	2.80	NA		0.01				0.015		0.01	2.80	0.62			
pH (standard units)	6.6	6.5	6.6	NA		6.6				6.4		6.40	6.60	6.54			1 pH
Nitrate Nitrogen (NO3)	4.7	1.9	4.7	NS		4.00						1.90	4.70	3.83	10	5	
Nitrite Nitrogen (NO2)	<0.20	<0.100	<0.020	NS		0.07						0.02	0.20	0.10	1	0.5	
NO3/NO2 as N										2.4		2.40	2.40	2.40	10	5	
Total Kjeldahl Nitrogen	0.14	95.20	0.49	NS		0.26						0.14	95.20	24.02			
Ammonia Nitrogen (NH3-N)	<0.10	<0.100	0.12	NS		<0.030						0.03	0.12	0.09			
E. Coli (CFU/100ml)	0	0	<1	NS		<1.0				<1		0.00	1.00	0.60	Absent	Absent	
Depth to groundwater (ft)	19.40	18.60	18.25	NS		25.10	18.35			18.95		18.25	25.10	19.78			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2F. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 1302.

Well 1302 is in the New Main (North) Leachfield System

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max Acceptable Change
Biochemical Oxygen Demand	<1.0	8.4	3.0	NS		3.00	NS					1.00	8.40	3.85			25
Chloride	27.4	58.7	23.9	NS		30.00				61.5		23.90	61.50	40.30	250	125	
Dissolved Phosphorus	0.21	0.17	2.20	NA		0.07				0.125		0.07	2.20	0.56			
pH (standard units)	6.3	6.5	6.6	NA		6.4				6.5		6.30	6.60	6.46			1 pH
Nitrate Nitrogen (NO3)	10.3	5.5	9	NS		8.20						5.50	10.30	8.25	10	5	
Nitrite Nitrogen (NO2)	<0.20	<0.020	<0.020	NS		0.11						0.02	0.20	0.09	1	0.5	
NO3/NO2 as N										3.6		3.60	3.60	3.60	10	5	
Total Kjeldahl Nitrogen	<0.10	0.95	0.82	NS		0.90						0.10	0.95	0.69			
Ammonia Nitrogen (NH3-N)	<0.10	0.32	<0.10	NS		0.49						0.10	0.49	0.25			
E. Coli (CFU/100ml)	0	26	<1	NS		3.00				<1		0.00	26.00	6.20	Absent	Absent	
Depth to groundwater (ft)	18.60	18.40	18.15	NS		27.40	18.20			18.50		18.15	27.40	19.88			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2G. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 1302R.

Well 1302R is in the New Main (North) Leachfield System

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max.Acceptable Change
Biochemical Oxygen Demand	<1.0	2.1	3.0	NS		<1.0	NS					1.00	3.00	1.78			25
Chloride	64.9	46.0	36.3	NS		45.50				42.4		36.30	64.90	47.02	250	125	
Dissolved Phosphorus	0.31	0.11	4.20	NA		0.04				0.285		0.04	4.20	0.99			
pH (standard units)	4.3	4.2	4.4	NA		6.1				5.3		4.20	6.10	4.86			1 pH
Nitrate Nitrogen (NO3)	45.5	41.0	40.8	NS		5.30						5.30	45.50	33.15	10	5	
Nitrite Nitrogen (NO2)	<0.20	<0.020	<0.020	NS		<0.020						0.02	0.20	0.07	1	0.5	
NO3/NO2 as N										20		20.00	20.00	20.00	10	5	
Total Kjeldahl Nitrogen	0.11	0.27	0.40	NS		0.23						0.11	0.40	0.25			
Ammonia Nitrogen (NH3-N)	<0.10	0.14	<0.10	NS		<0.030						0.03	0.14	0.09			
E. Coli (CFU/100ml)	0	0	<1	NS		15.00				<1		0.00	15.00	3.40	Absent	Absent	
Depth to groundwater (ft)	17.98	17.73	17.58	NS		29.28	18.18			18.18		17.58	29.28	19.82			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2H. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 1303.

Well 1303 is in the New Main (North) Leachfield System

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max Acceptable Change
Biochemical Oxygen Demand	<1.0	<1.0	11.0	NS		2.00	NS					1.00	11.00	3.75			25
Chloride	15.2	16.9	48.6	NS		22.30				60.2		15.20	60.20	32.64	250	125	
Dissolved Phosphorus	2.2	0.05	1.30	NA		0.02				0.013		0.01	2.20	0.72			
pH (standard units)	6.5	6.6	6.1	NA		6.4				6.6		6.10	6.60	6.44			1 pH
Nitrate Nitrogen (NO3)	2.5	3.6	41.6	NS		3.20						2.50	41.60	12.73	10	5	
Nitrite Nitrogen (NO2)	<0.020	<0.100	<0.020	NS		0.02						0.02	0.10	0.04	1	0.5	
NO3/NO2 as N										2.5		2.50	2.50	2.50	10	5	
Total Kjeldahl Nitrogen	0.16	272	0.14	NS		0.24						0.14	272.00	68.14			
Ammonia Nitrogen (NH3-N)	<0.10	<0.100	<0.10	NS		<0.030						0.03	0.10	0.08			
E. Coli (CFU/100ml)	62	0	<1	NS		<1.0				<1		0.00	62.00	13.00	Absent	Absent	
Depth to groundwater (ft)	20.06	19.46	19.16	NS		25.16	19.26			19.76		19.16	25.16	20.48			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2I. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 2101.

Well 2101 is in the COB (South) and New Warehouse Leachfield System, Upgradient

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max Acceptable Change
Biochemical Oxygen Demand	<1.0	1.4	8.0	4.0	2.00	4.00	2.00					1.00	8.00	3.20			25
Chloride	227	201	152	233	264.00	25.30	392.00	566.00	435.00	346	463	25.30	566.00	300.39	250	125	
Dissolved Phosphorus	0.15	<0.05	<0.05	<0.05	<0.05	0.01	<0.002	0.01	0.37	0.022	<0.005	0.00	0.37	0.07			
pH (standard units)	4.7	5.1	5.2	5.3	6.10	6.4	4.40	5.90	6.90	5.2	4.9	4.40	6.90	5.46			1 pH
Nitrate Nitrogen (NO3)	5.9	1.5	2.6	2.5	1.40	0.86	2.80	0.86	1.70			0.66	5.90	2.21	10	5	
Nitrite Nitrogen (NO2)	<0.20	<0.020	0.023	<0.02	<0.020	<0.020	<0.020					0.02	0.20	0.05	1	0.5	
NO3/NO2 as N										0.63	1.8	0.63	1.80	1.22	10	5	
Total Kjeldahl Nitrogen	<0.10	4.30	5.60	2.50	9.80	5.38	7.45					0.10	9.80	5.02			
Ammonia Nitrogen (NH3-N)	<0.10	5.00	5.00	1.20	5.10	4.10	7.35					0.10	7.35	3.98			
E. Coli (CFU/100ml)	0	34	<1	1	<1.0	<1.0	<1.0	<1.00	<1.0	<1	<1	0.00	34.00	3.91	Absent	Absent	
Depth to groundwater (ft)	9.26	11.01	7.66	12.41	10.31	15.36	8.11	10.61	9.56	6.96	9.36	6.96	15.36	10.06			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2J. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 2102.

Well 2102 is in the COB (South) and New Warehouse Leachfield System, Upgradient

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	MaxAcceptable Change
Biochemical Oxygen Demand	NS	NS	NS	NS			NS					0.00	0.00	0.00			25
Chloride	NS	NS	NS	NS				NS	Dry	Dry		0.00	0.00	0.00	250	125	
Dissolved Phosphorus	NA	NA	NA	NA				NS	Dry	Dry		0.00	0.00	0.00			
pH (standard units)	NS	NA	NS	NA				NS	Dry	Dry		0.00	0.00	0.00			1 pH
Nitrate Nitrogen (NO3)	NS	NS	NS	NS				NS	Dry			0.00	0.00	0.00	10	5	
Nitrite Nitrogen (NO2)	NS	NS	NS	NS								0.00	0.00	0.00	1	0.5	
NO3/NO2 as N										Dry		0.00	0.00	0.00	10	5	
Total Kjeldahl Nitrogen	NS	NS	NS	NS								0.00	0.00	0.00			
Ammonia Nitrogen (NH3-N)	NS	NS	NS	NS								0.00	0.00	0.00			
E. Coli (CFU/100ml)	NS	NS	NS	NS				NS	Dry	Dry		0.00	0.00	0.00	Absent	Absent	
Depth to groundwater (ft)	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry		0.00	0.00	0.00			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2K. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 3301.

Well 3301 is in the COB (South) and New Warehouse Leachfield System, Downgradient

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max.Acceptable Change
Biochemical Oxygen Demand	1.7	<1.0	17.0	15.0	4.00	<1.0	8.00					1.00	17.00	6.81			25
Chloride	149	123	159	250	237.00	237.00	225.00	251.00	260.00	399	410	123.00	410.00	245.45	250	125	
Dissolved Phosphorus	2.8	<0.05	1.00	<0.05	<0.05	0.02	0.17	0.02	0.02	0.036	<0.005	0.01	2.80	0.38			
pH (standard units)	6.4	6.5	6.6	6.8	6.40	6.6	6.70	5.90	6.80	6.4	6.5	5.90	6.80	6.51			1 pH
Nitrate Nitrogen (NO3)	0.022	0.055	0.026	<0.020	0.02	<0.020	0.04	<0.020	<0.020			0.02	0.06	0.03	10	5	
Nitrite Nitrogen (NO2)	0.054	<0.100	0.040	0.040	<0.020	0.02	<0.020					0.02	0.10	0.04	1	0.5	
NO3/NO2 as N										<.02	<0.020	0.02	0.02	0.02	10	5	
Total Kjeldahl Nitrogen	6.6	5.8	5.5	5.1	8.00	5.33	5.96					5.10	8.00	6.04			
Ammonia Nitrogen (NH3-N)	4.7	7.0	4.6	4.4	6.00	4.17	3.42					3.42	7.00	4.90			
E. Coli (CFU/100ml)	0	12	<1	<1	<1.0	<1.0	<1.0	<1.00	1.0	<1	<1	0.00	12.00	1.91	Absent	Absent	
Depth to groundwater (ft)	19.14	18.94	18.59	19.60	19.94	29.04	18.94	19.04	18.64	20.34	18.64	18.59	29.04	20.08			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2L. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 3302.

Well 3302 is in the COB (South) and New Warehouse Leachfield System, Downgradient

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max.Acceptable Change
Biochemical Oxygen Demand	<1.0	<1.0	8.0	4.0	5.00	3.00	5.00					1.00	8.00	3.86			25
Chloride	247	112	189	426	242.00	443.00	300.00	416.00	446.00	474	652	112.00	652.00	358.82	250	125	
Dissolved Phosphorus	1.2	0.069	0.110	0.058	0.12	0.04	0.05	0.03	0.02	0.028	0.013	0.01	1.20	0.16	-		
pH (standard units)	6.6	6.6	6.6	6.9	6.40	6.6	6.60	7.00	6.90	6.6	6.8	6.40	7.00	6.69			1 pH
Nitrate Nitrogen (NO3)	0.62	1.50	2.40	1.10	0.90	2.70	1.30	1.10	0.68			0.62	2.70	1.37	10	5	
Nitrite Nitrogen (NO2)	0.044	<0.100	0.056	0.051	<0.020	<0.020	0.04					0.02	0.10	0.05	1	0.5	
NO3/NO2 as N										2	1.7	1.70	2.00	1.85	10	5	
Total Kjeldahl Nitrogen	1.5	1.6	1.6	2.2	2.50	1.02	1.10					1.02	2.50	1.65			
Ammonia Nitrogen (NH3-N)	1.0	1.6	1.2	1.1	0.81	0.70	0.67					0.67	1.60	1.01			
E. Coli (CFU/100ml)	0	0	<1	<1	<1.0	<1.0	<1.0	<1.00	<1.0	<1	1	0.00	1.00	0.82	Absent	Absent	
Depth to groundwater (ft)	19.13	18.88	18.58	19.49	19.85	29.23	18.93	18.93	18.53	19.13	18.53	18.53	29.23	19.93			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2M. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 3401.

Well 3401 is in the COB (South) and New Warehouse Leachfield System, Downgradient

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max.Acceptable Change
Biochemical Oxygen Demand	<1.0	1.9	4.0	3.0	6.00	5.00	3.00					1.00	6.00	3.41			25
Chloride	63.6	78.5	47.9	80.6	54.30	57.30	70.30	1.37	111.00	118	78.1	1.37	118.00	69.18	250	125	
Dissolved Phosphorus	2.4	0.074	<0.05	<0.05	0.05	0.07	0.02	0.01	<0.020	0.012	<0.005	0.01	2.40	0.25			
pH (standard units)	5.9	6.1	6.0	6.3	6.00	6.0	6.00	5.90	6.80	6	6.1	5.90	6.80	6.10			1 pH
Nitrate Nitrogen (NO3)	2.1	1.8	2.5	2.1	2.70	6.10	7.20	4.50	4.20			1.80	7.20	3.69	10	5	
Nitrite Nitrogen (NO2)	<0.20	<0.100	<0.020	<0.02	<0.020	<0.020	<0.020					0.02	0.20	0.06	1	0.5	
NO3/NO2 as N										5.9	10.6	5.90	10.60	8.25	10	5	
Total Kjeldahl Nitrogen	0.21	0.29	0.46	0.16	1.40	<0.040	<0.040					0.04	1.40	0.37			
Ammonia Nitrogen (NH3-N)	<0.10	<0.100	0.35	<0.10	<0.10	<0.030	<0.030					0.03	0.35	0.12			
E. Coli (CFU/100ml)	0	0	<1	<1	<1.0	<1.0	<1.0	1.00	<1.0	<1	<1	0.00	1.00	0.82	Absent	Absent	
Depth to groundwater (ft)	19.10	18.80	18.25	19.35	19.70	28.75	18.95	18.75	18.40	18.65	18.32	18.25	28.75	19.73			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2N. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 6201.

Well 6201 is in the New Office Building Leachfield System, Upgradient

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	MaxAcceptable Change
Biochemical Oxygen Demand	<1.0	1.6	5.0	5.0	2.00		3.00					1.00	5.00	2.93			25
Chloride	2.7	2.1	1.3	2.2	1.60		97.90	95.80	44.80	65.6	26.2	1.30	97.90	34.02	250	125	
Dissolved Phosphorus	0.091	<0.05	2.300	<0.050	<0.05		0.02	0.02	0.27	0.016	0.024	0.02	2.30	0.29			
pH (standard units)	6.0	7.1	5.9	6.3	6.00		5.80	6.00	6.90	5.8	5.9	5.80	7.10	6.17			1 pH
Nitrate Nitrogen (NO3)	11.5	6.3	5.6	4.8	4.60		7.50	5.50	4.90			4.60	11.50	6.34	10	5	
Nitrite Nitrogen (NO2)	<0.20	<0.200	<0.020	<0.020	<0.020		<0.020					0.02	0.20	0.08	1	0.5	
NO3/NO2 as N										3.6	4.9	3.60	4.90	4.25	10	5	
Total Kjeldahl Nitrogen	0.22	0.62	0.66	3.60	0.98		1.62					0.22	3.60	1.28			
Ammonia Nitrogen (NH3-N)	<0.10	0.26	0.17	0.61	<0.10		0.05					0.05	0.61	0.21			
E. Coli (CFU/100ml)	0	22	<1	2	<1.0		<1.0	>2,420	6.00	<1	25	0.00	2420.00	247.90	Absent	Absent	
Depth to groundwater (ft)	5.58	5.93	3.63	6.68	6.93	DRY	4.83	6.23	6.23	6.43	5.63	3.63	6.93	5.81			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2O. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 6202.

Well 6202 is in the New Office Building Leachfield System, Downgradient

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max Acceptable Change
Biochemical Oxygen Demand	<1.0	2.0	6.0	4.0	5.00	2.00	3.00					1.00	6.00	3.29			25
Chloride	4.7	2.3	2.2	2.2	1.70	2.30	1.30	1.60	2.30	4	2.5	1.30	4.70	2.46	250	125	
Dissolved Phosphorus	0.22	0.11	0.45	<0.050	<0.05	0.05	0.07	0.05	<0.020	0.046	0.032	0.02	0.45	0.10			
pH (standard units)	6.3	6.4	6.3	6.3	6.20	6.4	6.50	6.30	6.90	6.3	6.4	6.20	6.90	6.39			1 pH
Nitrate Nitrogen (NO3)	28.7	8.40	14.20	1.40	1.50	2.70	0.87	1.20	0.16			0.16	28.70	6.57	10	5	
Nitrite Nitrogen (NO2)	<0.20	<0.200	<0.020	<0.020	<0.020	<0.020	<0.020					0.02	0.20	0.07	1	0.5	
NO3/NO2 as N										0.21	1.5	0.21	1.50	0.86	10	5	
Total Kjeldahl Nitrogen	0.40	1.20	0.54	0.80	0.54	0.99	0.77					0.40	1.20	0.75			
Ammonia Nitrogen (NH3-N)	<0.10	0.12	<0.10	<0.10	<0.10	<0.030	0.03					0.03	0.12	0.08			
E. Coli (CFU/100ml)	2500	0	<1	6	4.0	6.0	<1.0	>2,420	461.0	<1	3	0.00	2500.00	491.18	Absent	Absent	
Depth to groundwater (ft)	6.90	7.10	5.10	7.70	8.10	10.20	6.50	7.40	7.25	3.10	6.80	3.10	10.20	6.92			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2P. Vermont Yankee's Indirect Discharge Permit ID-9-0036
Groundwater Quality Monitoring Data for Well 6203.

Well 6203 is in the New Office Building Leachfield System, Downgradient

Date PARAMETER (mg/l unless noted)	3-Apr-00	3-Oct-00	7-Apr-01	15-Oct-01	11-Apr-02	16-Oct-02	16-Apr-03	4-Aug-03	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max.Acceptable Change
Biochemical Oxygen Demand	<1.0	1.3	7.0	NS	7.00		8.00					1.00	8.00	4.86			25
Chloride	2.4	3.1	2.6	NS	6.70		3.90	6.00	5.20	6.1	11.6	2.40	11.60	5.29	250	125	
Dissolved Phosphorus	0.42	0.56	0.08	NS	<0.05		0.04	0.12	<0.020	0.014	0.016	0.01	0.56	0.15			
pH (standard units)	6.2	6.5	6.2	NS	6.10		6.20	5.90	7.10	6.1	6.0	5.90	7.10	6.26			1 pH
Nitrate Nitrogen (NO3)	0.60	0.028	0.110	NS	0.06		0.08	0.29	0.03			0.03	0.60	0.17	10	5	
Nitrite Nitrogen (NO2)	<0.020	0.023	<0.020	NS	<0.020		<0.020					0.02	0.02	0.02	1	0.5	
NO3/NO2 as N										<0.02	0.047	0.02	0.05	0.03	10	5	
Total Kjeldahl Nitrogen	0.76	0.41	1.20	NS	1.90		1.40					0.41	1.90	1.13			
Ammonia Nitrogen (NH3-N)	<0.10	0.31	0.10	NS	0.32		0.08					0.08	0.32	0.18			
E. Coli (CFU/100ml)	18	32	<1	NS	<1.0		<1.0	>2,420	225.00	<1	16	1.00	2420.00	301.67	Absent	Absent	
Depth to groundwater (ft)	6.45	7.70	4.00	8.55	7.17	DRY	5.20	9.10	7.00	4.90	7.15	4.00	9.10	6.72			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2Q. Vermont Yankee's Indirect Discharge Permit ID-9-0036 Groundwater Quality Monitoring Data for Well 221.

Well 221 is in the Northwest Leachfield System

Date PARAMETER (mg/l unless noted)	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max.Acceptable Change
Biochemical Oxygen Demand									25
Chloride	15.00	32.3	52.4	15.00	52.40	33.23	250	125	
Dissolved Phosphorus	1.10	0.011	<0.005	0.01	1.10	0.37			
pH (standard units)	6.70	6	6.0	6.00	6.70	6.23			1 pH
Nitrate Nitrogen (NO3)	5.10			5.10	5.10	5.10	10	5	
Nitrite Nitrogen (NO2)							1	0.5	
NO3/NO2 as N		6.8	17.6	6.80	17.60	12.20	10	5	
Total Kjeldahl Nitrogen									
Ammonia Nitrogen (NH3-N)									
E. Coli (CFU/100ml)	<1.0	<1	<1	1.00	1.00	1.00	Absent	Absent	
Depth to groundwater (ft)	9.00	7.40	9.40	7.40	9.40	8.60			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

Table 2R. Vermont Yankee's Indirect Discharge Permit ID-9-0036 Groundwater Quality Monitoring Data for Well 221A.

Well 221A is in the Northwest Leachfield System

Date PARAMETER (mg/l unless noted)	7-Oct-03	5-Apr-04	7-Oct-04	MIN	MAX	MEAN	Enforcement Std	PAL #1	Max.Acceptable Change
Biochemical Oxygen Demand									25
Chloride	20.50	44.2	53.3	20.50	53.30	39.33	250	125	
Dissolved Phosphorus	<0.020	0.086	0.006	0.01	0.09	0.04			
pH (standard units)	6.80	7.2	7.3	6.80	7.30	7.10			1 pH
Nitrate Nitrogen (NO3)	7.80			7.80	7.80	7.80	10	5	
Nitrite Nitrogen (NO2)							1	0.5	
NO3/NO2 as N		4.1	5.7	4.10	5.70	4.90	10	5	
Total Kjeldahl Nitrogen									
Ammonia Nitrogen (NH3-N)									
E. Coli (CFU/100ml)	<1.0	<1	<1	1.00	1.00	1.00	Absent	Absent	
Depth to groundwater (ft)	9.00	11.00	9.10	9.00	11.00	9.70			

Notes:

NA = Parameter not required for analysis.
NS = Parameter not sampled.

ATTACHMENT 5

Condition by Condition Review of Permit Compliance Between 2000 and 2004

Condition by Condition review of IDP Permit compliance by Vermont Yankee.

Condition #	Description	Schedule Date	Completion Date, By Year 2000	2001	2002	2003	2004
A3	Apply for renewal of IDP	30-Jun-05	Extended to allow submission on July 7, 2005				
C3	Submit Copy of contract with a VT registered P.E. to provide inspection of system construction	Before start of any construction on the collection, treatment, and disposal system				07/10/2003	
C4	Submit inspecting Engineer's Certification of Construction	Within 30 days following completion of construction				10/29/2003	
D2	Annual inspection of all sewage collection, treatment, and disposal systems by VT Registered P.E.	Annually April	4/3/00	4/4/01	4/15/02	4/14/03	4/6/04
D3	Submit tabulation of ponding levels	At the end of each Station outage period in each annual septic system inspection	none required 4/3/00	6/11/01 4/4/01	12/3/02 4/15/02	none required 4/14/03	6/14/04 4/6/04
D4	Notify Secretary of pumping of tanks for land application	After receipt and approval from ANR of radioactive analyses and before pumping from COB holding tank for land application	8/8/00	6/20/01	6/11/02	6/12/03	none required
E2(A)	Collect and analyze effluent samples Submission of monitoring results	daily water use - continuously chemical analyses - April and October By the 15th of the second month following the date of sampling	Daily Apr & Oct 6/13 & 12/13	Daily Apr & Oct 6/11 & 12/10	Daily Apr & Oct 5/02 & 12/02	Daily Apr, Aug*, Oct 5/19, 9/24*, 12/5	Daily Apr & Oct 6/14 & 12/14
E2(B)	Record water meter readings Submission of monitoring results	Daily readings By the 15th of the second month following the date of sampling	Daily Daily water water meter readings provided for each month during the year	Daily	Daily	Daily	Daily
E3(A)	Collect and analyzed groundwater samples Submission of monitoring results	chemical analyses April and October By the 15th of the second month following the date of sampling	Apr & Oct 6/13 & 12/13	Apr & Oct 6/11 & 12/10	Apr & Oct 5/02 & 12/02	Apr, Aug*, Oct 5/19, 9/24*, 12/5	Apr & Oct 6/14 & 12/14
E3(B)	Measure and record depths to groundwater in monitoring wells Submission of monitoring results	weekly in April and October By the 15th of the second month following the date of sampling	6/13 & 12/13	weekly in April and October until the well is sampled 6/11 & 12/10	5/02 & 12/02	5/19, 9/24*, 12/5	6/14 & 12/14
E4(A)	Collect and analyze receiving stream samples Submission of monitoring results	not required unless requested in writing from Secretary By the 15th of the second month following the date of sampling	Not Required between 2000 and 2004 Not Required between 2000 and 2004				
E5	Submit evaluation by a water quality specialist of all required effluent, ground, and surface water quality data and biological monitoring data	30-Jun-05	NA	NA	NA	NA	NA

* Two land applications of biosolids in 2003 required an additional round of groundwater and septic effluent analyses in August, with reports submitted in September.

ATTACHMENT 6

Application Fee

RECEIVED
MAY 31 2005
ACCOUNTS PAYABLE

PEARL SYSTEM
DISBURSEMENT REQUEST

Date: 19-May-05

*please send check to Lynn DeWald so I can put it in the package with the permit renewal application. thanks.

Issue check in favor of: State of Vermont

Vermont Department of Environmental Conservation, Wastewater Management Division

103 South Main Street - The Sewing Building, Waterbury, VT 05671-0405

Amount: $100.00

Date required: 20-Jun-05

Reason for check: Indirect Discharge Permit - Administrative processing fee for 5-year permit renewal

5 digit Business Unit	5 digit Dept Code	Resource Code	Activity Code	10 digit Project Code	Physical Location	Amount
72000	NEK24	360	COCR	F3PC4B5450	VY1	$100.00
					Total	$100.00

Requested By: Lynn DeWald — Signature — May 19, 2005 — Date

Authorized By: [signature] — Signature — 5/19/05 — Date

\\vyshared1.enne.corp.entergy.com\public\Budget Info\Forms\PEARLreq.xls Rev 7/2004

Check Date: 06/07/2005 Check No. 4798993

Invoice Number	Invoice Date	Payment Message	Gross Amount	Discount Available	Paid Amount
0519200510000	05/19/2005	Indirect Discharge Permit	100.00	0.00	100.00

Vendor Number	Name		Total Discounts	
089580	STATE OF VT		0.00	
Check Number	**Date**	**Total Amount**	**Discounts Taken**	**Total Paid Amount**
4798993	06/07/2005	100.00	0.00	100.00

PLEASE DETACH BEFORE DEPOSITING

"VERIFICATION BOX" (TO RIGHT OF ARROW. HOLD BETWEEN THUMB AND FOREFINGER, OR BREATHE ON IT, COLOR WILL DISAPPEAR, THEN REAPPEAR) THIS CHECK CLEARS USING POSITIVE PAY

Entergy

Entergy Services, Inc. Agent For:

Entergy Corporation, Entergy Mississippi Inc., Entergy Services Inc., Systems Fuels Inc.
Entergy Gulf States Inc., Entergy Louisiana Inc., Entergy New Orleans Inc.,
System Energy Resources Inc., Entergy Operations Inc., Entergy Arkansas Inc.
P.O. Box 61000 New Orleans, LA 70161-1000

JPMORGAN CHASE DELAWARE
NA
Wilmington, DE 19801
62-26/311

4798993

6029-09

Date 06/07/2005 Pay Amount 100.00***
(VOID AFTER 60 DAYS)

Pay ****ONE HUNDRED AND XX/100 DOLLAR****

SECURITY FEATURES INCLUDED DETAILS ON BACK

To The Order Of STATE OF VT
DEPT OF ENVIRONMENTAL CONSERVA
103 SOUTH MAIN ST
WATERBURY, VT 05671-0404

Executive Vice President and Chief Financial Officer

Vice President and Treasurer

MP

⑈4798993⑈ ⑆031100267⑆ 6301460295509⑈