VILLAGE OF BARRINGTON HILLS

Board of Health

NOTICE OF MEETING

Tuesday, May 12, 2015 ~ 7:30 pm
112 Algonquin Road

AGENDA

1. Organizational
   1.1 Call to Order
   1.2 Roll Call
2. [Vote] Minutes
3. [Vote] 170 Old Sutton Road - Septic Variance
4. [Vote] Septic Code Amendments - Section 4-2-7
5. Level II Program Results Discussion
6. Public Comment
7. Trustee's Report
8. Adjournment

Chairman: Gwynne Johnston

NOTICE AS POSTED

VILLAGE OF BARRINGTON HILLS
BOARD OF HEALTH MEETING
February 10, 2015

The regular meeting of the Village of Barrington Hills Board of Health was called to order at 7:35 p.m. by Chairman Johnston.

Board of Health Members Present:	Gwynne Johnston, Chairman Shirley Conibear, M.D. Anne Majewski, M.D.
Board of Health Members Absent:	Frank J. Konicek, M.D., Vice Chairman
Others Present:	Michael Harrington, Village Trustee Dan Strahan, Village Engineer Janet Agnoletti, BACOG Kurt Thomsen, Scott Siman, Land Technology Inc. John Rosene, Resident Lou Anne Majewski, Resident

APPROVAL OF MINUTES: Dr. Majewski requested a revision to the minutes regarding her comments pertaining to the horse density/livestock report. Dr. Conibear made a motion to approve the minutes, as amended, of the January 13th, 2015 meeting of the Board of Health. The motion was seconded by Dr. Majewski and approved unanimously.

SEPTIC VARIANCE – 11 PERAINO CIRCLE: Scott Siman, the design engineer for the property owner, presented a request for variance with regard to the proposed septic system. Mr. Siman noted that the Village septic code requires a minimum separation of 24" between the bottom of the septic system and the limiting layer. Based on soil tests performed at the site the depth to the limiting layer was found to be 29"deep in the area of the proposed septic system, precluding the possibility of a traditional trench system. To meet the setback requirement, Mr. Siman proposed an at-grade mound system designed in accordance with the design standards of the Lake County Health Department.

Dr. Majewski asked whether the development was a garage addition or a poolhouse. It was noted that the initial application did not include any bedrooms, but subsequently the applicant had added two bedrooms, though currently there is no pool existing or proposed on the property. Village Engineer Dan Strahan noted that GHA had received revised plans and all of the previous comments had been addressed, pending approval of the variance.

After further discussion Dr. Conibear made a motion, seconded by Dr. Majewski, for approval of the request for a septic variance to construct a Type IV at-grade mound system. The motion was approved by all members present.

WATER QUALITY STUDY:

Village Hall Level II Test Results: Mr. Strahan summarized the results of groundwater testing conducted at the Village Hall. Hardness, iron, and strontium were discussed as parameters of interest from the test results.

Level II Program: Chairman Johnston requested information regarding the cost of various testing facilities under consideration for the Village-wide testing program. Mr. Strahan noted that three potential locations were researched: the Illinois State Water Survey (ISWS) thru BACOG, the Kane-Dupage Soil & Water Conservation District program, and McHenry Analytical Labs. Mr. Strahan noted that the ISWS program was the least expensive but less flexible with regard to the timing of samples and that McHenry Analytical Labs was the most expensive but was more flexible and the testing facility is certified by the IEPA.

Ms. Agnoletti clarified concerns regarding the capacity of the ISWS program, noting that the waiting list had been decreasing and that BACOG was willing to commit to provide the samples to the ISWS if others were performing the coordination and collecting the samples. Chairman Johnston noted that the Village Engineer would coordinate with property owners and collect the samples. Dr. Majewski asked if the time of year that samples were taken would make a difference. Mr. Thomsen noted that it probably would not, but recommended consistent timing to remove any potential seasonal variation as a variable. After further discussion, the Board agreed to proceed with testing through the ISWS program administered by BACOG, with collection of samples performed and coordinated by the Village Engineer's office.

Groundwater Aging: Mr. Strahan summarized a memo provided by the United States Geologic Survey that outlined a technique to test environmental tracer elements to determine an approximate age of groundwater. After discussion of the details of this testing, the Board determined that the previously discussed testing program was sufficient and that groundwater aging could be revisited at a later date if determined to be beneficial.

SEPTIC AMENDMENTS DRAFT:

IDPH Status Report: Mr. Strahan noted that the draft amendments had been submitted to the Illinois Department of Public Health for review and approval. The IDPH had acknowledged receipt but had not yet provided comments.

Septic Flow Rates for Barns & Stables: Mr. Strahan reviewed the rationale behind draft recommendations for flow rates for residential, recreational, and commercial barns and stables. It was noted that septic design criteria tends to be very conservative, based on peak usage rather than average or typical usage. Mr. Strahan noted that septic effluent from a barn or stable can come from human uses, such as bathrooms or kitchens, as well as floor drains that may collect excess urine and wash waters from the horse stalls. Mr. Strahan also recommended consideration to allow a reduced system if water meter is installed to verify a lower usage than what the code requires.

Mr. John Rosene commented that the figure of 10 gallons per day seemed high. Chairman Johnston noted that this observation may be average use, while 10 gallons per day would be peak use.

Further discussion ensued regarding when floor drains would be required, how potential changes may be incorporated into the code, and whether further public involvement may be warranted. Trustee Harrington recommended that the topic be referred to the Equestrian Commission for further input. Dr. Conibear made a motion, seconded by Dr. Majewski, to forward the recommended flow rates along with a summary of code changes that would result to the Equestrian Commission for review and comment back to the Board of Health. The motion was passed unanimously.

PUBLIC COMMENT: Lou Anne Majewski noted that during an application for a new barn approximately two years ago testimony was made to the Plan Commission regarding specific water usage anticipated.

Chairman Johnston noted that another public comment was provided via email by Gail Baldwin. He noted that he would forward the email to Mr. Kosin and Mr. Strahan (text of the email is attached).

Mr. Rosene asked about the availability of minutes for Board of Health meetings. Mr. Strahan noted that both meeting minutes and a full audio recording for each Board of Health meeting is available on the Village website.

TRUSTEE'S REPORT: Trustee Harrington noted that he had provided an update to the Village Board on the groundwater testing program as well as an update on the proposed septic amendments. Chairman Johnston requested that an additional Board of Health member be added to assist in meeting quorum requirements. Dr. Majewski suggested that a notice be posted on the Village website.

ADJOURNMENT: Dr. Conibear motioned to adjourn at 8:45 PM. Dr. Majewski seconded the motion. All present said aye.

Bob, Dan,

As indicated at the BOH meeting last night, I would agree to having this posted as part of the public comment, provided that we verify the accuracy of the quoted source.

Gwynne

From: Gail Baldwin [mailto:horsin360@gmail.com]

Sent: Monday, February 09, 2015 7:04 PM

To: clerk@barringtonhills-il.gov; gjohnston@barringtonhills-il.gov; fkonicek@barringtonhills-il.gov; sconibear@barringtonhills-il.gov; amajewski@barringtonhills-il.gov; mharrington@barringtonhills-il.gov

Subject: Impact of Horse farms on Ground Water - Public comment for 2/10/15 Board of Health meeting

Please enter this information into the public record under public comment for the Board of Health meeting tomorrow, Tuesday 2/10/15:

This is from the AmericanTrails.org website. It does state the origin of the studies where they have gathered this information from. There is excellent verbiage regarding contamination of groundwater being only associated with nearby feedlots housing thousands of animals. I don't think we are in any danger of this sort of thing.

The last paragraph is particularly interesting regarding the salts in urine dissipating in approximately 3 days.

And, some valid points is that we should be more worried about fertilizers and aging septic systems than horses living next to a creek:

Water Quality and Horses on Trails
The endpoints of scientific inquiry for water quality studies are human exposure to pathogens for health implications and nutrient/sedimentation pollution for environmental implications. Excrement or wastes of any type should never be deposited or disposed of in water bodies.

Human Health
Coliforms are ubiquitous in the environment. While they are not necessarily harmful to people if ingested, coliforms are an indicator that unwanted matter is present in the water system. Their virulence is little understood; hence the precautionary care to prevent human exposure to excess amounts of them. Coliforms, however, have not been known to injure aquatic organisms or wildlife according to Dr. Michael Rugg, Toxicologist, California State Fish and Game, Yountville CA. Recent scientific studies and their replicates confirm that adult horse guts do not significantly contain E. coli 0157:H7, Salmonella, Cryptosporidium, or Giardia, which are the organisms of most concern in water-borne spread of disease. (Atwill, et al; see several references.)

Groundwater
We have found no studies that we found implicating equids in groundwater contamination. Horses eliminate primarily in their pastures and paddocks (Meyer 1997). Manure left in a loose heap in deposits on trails loses its nitrogen rapidly (New Hampshire 1990). It is inconceivable that trail horses making dispersed deposits could possibly impact ground water. Most contamination of this sort occurs from areas

associated with feedlots where thousands of commercially harvested animals are confined at one time, or from excessive fertilization added to soils.

Compared to other large livestock, horse manure is relatively "dry" and "hot" due to unique digestive enzymes and flora. Once deposited, it can achieve total mineralization in as short a time as 21 days (Ajwa, et al 1994). Because it is so dry at excretion, nutrients tend to volatilize rapidly into the atmosphere. One of the challenges in preserving nutrients in horse manure is to get them turned into the soil as rapidly as possible before the nutrients are lost to the air.

Surface Water

Again, there are very little data about impacts from horses. Bacteriological and nutrient effects (on water bodies) are seldom detectable except next to stables. (Williams et al, 1998). As part of the 319(h) grants from the Clean Water Act, new data are becoming available. Five studies have taken place in the San Mateo County watersheds to date (2002). It is important to keep in perspective that these studies involve settings where horses live 24 hours/day next to a creek. Thus far, data have not confirmed significant adverse affects on the surface waters immediately adjacent to them. Leaking aging septic systems, residential over-fertilizing, and certain agricultural practices are suspected where data exceed recommended standards. Given this, it is difficult to conceive of a situation where the manure from a few horses on a trail could adversely impact surface water nearby. Again, most trails are not sited immediately adjacent to water bodies and Mother Nature has a marvelous buffering capacity when even as little as 10 feet of vegetation is available at the side of a trail.www.ca.nrcs.usda.gov/rts/sec4.htm

Phosphorus and potassium are the trace constituents of most concern in horse urine. They bind to soil particles and may be eroded away into surface water bodies. They would be present only in the minutest of quantities in manure on trails, thus of little concern. For horses paddocked near streams, a recent study by Dr. Michael Rugg on accumulation of urine salts in soil in arid climates demonstrated that these salts could be dissipated in just three days by watering dry paddocks to invite biological degraders to the soil. Thus a simple BMP of turning on a sprinkler once a day will not only keep dust down, but will mitigate urine salt accumulation in paddock soils.

Submitted by: Gail Baldwin & Ross Friedmann

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GEWALT HAMILTON ASSOCIATES, INC.
CONSULTING ENGINEERS
625 Forest Edge Drive, Vernon Hills, IL 60061
TEL 847.478.9700 ■ FAX 847.478.9701
www.gha-engineers.com

MEMORANDUM

To: Robert Kosin, Village of Barrington Hills
Board of Health Members

From: Daniel J. Strahan, P.E., CFM
Gewalt Hamilton Associates

Date: May 8, 2015

Re: 170 Old Sutton Septic Variance

At the upcoming meeting of the Board of Health on Tuesday, May 12, 2015, the Board will give consideration to a septic system variance for the proposed polo field facilities at 170 Old Sutton Road. Based on the results of the soil test, the design engineer has proposed 12" of fill in the area of the proposed septic system in order to meet the required separation from the limiting layer, found to be 37" below the ground surface. As the typical trench system requires a minimum 18" depth, the bottom of the trench would be within 24" of the limiting layer if installed conventionally.

Section 4-2-7(D)11 allows administrative variances for repair situations, but no such provisions are included for new systems:

> *11. Variances: In order to address contingencies or provide relief to practical difficulties, the provisions and appendices of this section may be varied in accordance with the specific instances hereinafter set forth:*
>
> *a. New Private Sewage Disposal Systems: Upon a determination by the building officer that the installation of a new private sewage disposal system cannot be accomplished in compliance with the provisions and appendices of this section, the applicant may seek a variance in accordance with the procedures and standards set forth in subsection 6-3-5(C) of this code.*
>
> *b. Repairing Private Sewage Disposal System: A variance from the provisions and appendices of this section, if needed for the repair of a private sewage disposal system, may be granted or denied by the building officer, with an appeal to the board of health. The building officer may approve variances allowing up to one foot (1') of fill material over existing ground to accommodate an otherwise standard trench system. Variances requesting more than one foot (1') of fill or an alternate system type may only be approved by the board of health. However, no variance shall be granted unless the applicant satisfactorily demonstrates its said variance is necessary for the system to comply with the purpose of this section.*

It is noted that the purpose of this section is not to permit placement of fill over the top of existing systems, but rather to allow proposed systems to utilize fill to allow for the trench to be placed higher in the soil profile, maximizing the vertical separation between the trench and groundwater, limiting layers, or adjacent surface water.

3600 I-70 Drive SE, Suite E, Columbia, MO 65201 ■ TEL 573.397.6900 ■ FAX 573.397.6901
The Monadnock Building, 53 W. Jackson Blvd., Suite 924, Chicago, IL 60604 ■ TEL 312.329.0577 ■ FAX 312.329.1942

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CONSULTING ENGINEERS

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May 1, 2015

Mr. William J. Cussen, P.E.
Robinson Engineering
300 Park Blvd. Suite 309
Itasca, Illinois 60143

Re: Passion for Polo- Indoor Arena & Polo Field
Site Development Permit Application
Plan Review #2

Dear Mr. Cussen:

Our office has reviewed the site development plans submitted for the proposed indoor arena and polo field at the above referenced address. Based on our review revisions are required prior to approval. Our review is based on the following materials:

- Civil Engineering Plan Set, prepared by Robinson Engineering, received by the Village of Barrington Hills on April 10, 2015.
- Stormwater Report prepared by Robinson Engineering, Project 14-239, dated April 9, 2015 and received by the Village of Barrington Hills on February 10, 2015.
- Watershed Development Permit application received by the Village of Barrington Hills on April 10, 2015.
- MWRD application received by the Village of Barrington Hills on April 10, 2015.
- Natural Area Enhancements and Mitigation Plan, prepared by Trillium Native Landscapes, received by the Village of Barrington Hills on April 10, 2015.
- Erosion and Sediment Control Plan, prepared by Robinson Engineering, received by the Village of Barrington Hills on April 10, 2015.
- Soils Boring Reports prepared by SMC, received by the Village of Barrington Hills on April 10, 2015.

Permitting Agencies

The following permits will be required for the proposed development prior to construction:

- Cook County Department of Transportation and Highways Permit for access, culvert, and associated grading within the ROW of Old Sutton Road.
- Cook County Health Department well permit.
- NOI & SWPPP submittal to IEPA.
- Watershed Development Permit (Village of Barrington Hills, MWRD)
- US Army Corps Permit for wetland impacts

Soil Erosion and Sediment Control Plan

1. Sheet 1 – Label the project limits which are hatched on the location map. The legend for the location map has a bold line indicating proposed improvements but there are no lines correlating to this.
2. Sheet 1 - Provide owner, engineering, architect information along with any other parties who are involved in this project. Also, list utility contacts which pertain to this project.
3. Sheet 2 – Identify the project limits on maps.

4. Sheet 2 – Note 11 under stabilization practices reference the Village of Lansing; revise to the appropriate information.
5. Sheet 2 – Under erosion control notes a reference to Will/South Cook Soil and Water Conversation District is reference revise to the appropriate information.
6. Sheet 2 – Under erosion control notes the rate of applying the fertilizer is 1000 lbs/acre but the reference on sheet 17 of the civil plans has a different rate of 20 lbs/1,000 SF stated on sheet 4 note 6 under final stabilization. Clarify information between plans.
7. Sheet 3 – The north section of grading is proposed outside the limits of the silt fence. All disturbance shall be contained within the limits of the silt fence.
8. Sheet 3 – Silt fence shall be installed between the existing building and proposed building. The plans call out for a disturbance of the soil by re-grading the swale and storm sewer. Runoff drains off site, therefore silt fence is required to contain this area.
9. Sheet 3 – There is no rip rap proposed or shown at the proposed out fall structures.
10. Sheet 3 – At the flared end in the northwest corner there are symbols adjacent to the structure which look like bales. The legend calls out inlet and pipe protect but the detail shows the incorrect measures for flared end sections. Revised the erosion control at the outfalls.
11. Sheet 3 – The legend references seeding class 2A with a specific hatch. The areas on the plans with this hatch have callouts for different class seeding (ie 1 & 3). Clarify which seeding class will be used in these areas.
12. Sheet 3 – In the northwest corner there is a bold dashed line in a circle. What is this depicting?

Civil Engineering Plan

1. Sheet 1 – Call out project location on location map. Clarify the location of the proposed bold line depicted in the location map legend.
2. Sheet 1 - Provide owner, engineering, architect information along with any other parties who are involved in this project. Also, list utility contacts which pertain to this project.
3. Sheets 2-3 – Review and revised general notes for typos and formatting errors. Also, note 18 under Underground Utilities states the sanitary service installed at a minimum of 1%. Sanitary services shall be installed at a minimum of 2%.
4. Sheet 4 – Note 5 under Erosion Control states “Stockpile shall be temporary seeded within 14 days…” The Lake County standards are all exposed soil, including stock piles, shall be seeded within 7 days of disturbance.
5. Sheet 4 – Note 1 under Final Stabilization states I.D.O.T Blass 1 this seems to be a typo. The note references class 1 seeding yet the plans call out for class 2A. Clarify which seed shall be standard for this project.
6. Sheet 4 – Note 6 under Final Stabilization states a different rate of fertilizer application then the erosion control plan set submitted. Refer to comment # 6 under the erosion control plan section.
7. Sheet 5 - The approximate depth of the existing drain tile information should be updated based on the information provided within the drain tile survey.
8. Sheet 5-8 – Call out trees to be removed. The plans have a note referring to a tree preservation plan but there is was no preservation plan submitted. Call out trees to be removed and reference the appropriate plan.
9. Sheet 9 - A better defined flow path should be provided for the area east of the septic field to route the two pipe discharges to the pond area. Indicate the swale with the appropriate line type shown in the legend.

10. Sheet 11 – Label the 100 year overflow route for the area south of the building. Where will this area overtop for flows exceeding a 10-year return interval?
11. Sheet 13 – The pipe called out between FES 14 & the control structure has a slope of 0%. Proposed pipes shall maintain a slope to obtain self-cleansing velocity.
12. Sheet 13 – Identify the 75' setback line around the existing well.
13. Sheet 13 – What is the gravel hatch located west of the well representing?
14. Sheet 14 – Call out pipe material, length and slope from the cleanouts to FES 12 & 13.
15. Sheet 14 – Proposed underdrains shall have a slope in order to allow for cleaning velocity.
16. Sheet 14 - Provide additional information relative to the proposed underdrain system along the east side of the polo field. Intermediate structures at a 250' maximum spacing or at changes in the pipe size for maintenance purposes should be provided. The proposed detail will need to be adjusted based on the depth shown.
17. Sheet 16 – Design detail is required for the apparent drain tile intercept shown on sheet C-15. Indicate proposed slope, pipe material, and lengths and provide a structure at each change in direction, even if elevations are approximate. Approximate depths were provided in the drain tile survey provided by Huddleston McBride.
18. Sheet 18 – Provide the appropriate dimensions for the construction entrance detail and the rip rap detail.
19. Sheet 19 – Label the orifice elevation.
20. For future submittals, the "Wetland Mitigation and Proposed Natural Area Enhancements" plan prepared by Trillium Native Landscapes should be included in the overall plan set or at a minimum referenced so that the improvements shown are completed.

Stormwater Report

1. Based on the scope of the project as indicated in the site plan, the work would be classified as a Major Development per the Lake County Watershed Development Ordinance. In accordance with the submittal requirements for a Major Development under the Lake County WDO, the following documents should be included in the final submittal:
   - Maintenance Plan for the stormwater management system

2. A tributary area exhibit should be provided to demonstrate whether runoff from any offsite areas will access the proposed detention pond volume. This was not found in the submitted stormwater report.

Septic System Design Plan Review

The following comments pertain to the septic system design plan prepared by Heritage Land Consultants, dated April 7, 2015.

1. The proposed septic system design shows approximately 12" of fill over a trench septic system in order to meet the required 24" separation from the limiting layer. As the Village septic code requires trench systems to maintain the existing grade elevation, a variance would be required from the Board of Health. Upcoming Board of Health meetings are scheduled for Tuesday, May 12th and Tuesday, June 9th.
2. The proposed contours on the septic system design plan should be updated to reflect the final proposed contours shown in the site development plans.

3. The proposed curtain drain will require adjustment as the east end of the southernmost distribution trench is within 15' of the curtain drain.
4. Provide a cleanout at the bend in the building sewer.
5. As shown, the top of the septic tank will be approximately 9' below grade. We recommend consideration be given to adjusting the location of the tank or the pipes that are being crossed to reduce the proposed burial depth.

Sincerely,
Gewalt Hamilton Associates, Inc.

Daniel J. Strahan, P.E., CFM
Village Engineer

cc: Peder Finnberg, HLC
Robert Kosin, VBH Director of Administration
Wendi Frisen, VBH Building & Zoning Enforcement Officer

ASOOSOCIATES

Village of Barrington Hills
Board of Health
112 Algonquin Road
Barrington Hills, IL 60010
847-551-3000
clerk@barringtonhills-il.gov
May 08, 2015

RE: Cauthorn Farms, LLC
Polo Field & Arena
170 Old Sutton Road
Barrington Hills, IL 60010
Soos Project Number: 13SA138

Dear Chairman Gwynne Johnston,

On behalf on Jan-Dirk Lueders, Sole Member of Cauthorn Farms, LLC, I Robert S. Soos, Agent for Owner, respectfully request to be placed on the scheduled May 12th Board of Health Meeting Agenda. We will present a request for variance with regards to the proposed septic system at 170 Old Sutton Road.

Please contact me directly with any comments or questions.

Thank you,

Robert S. Soos
Soos & Associates, Inc.

Copy to:
Jan-Dirk Lueders
Peder Finnberg, P.E.: Heritage Land Consultants, LLC.
Daniel J. Strahan, P.E., CFM: Village Engineer, Gewalt Hamilton Associates, Inc.
Bill Cussen, P.E. ENV SP, LEED AP: Robinson Engineering

Soos & Associates, Inc.
Architecture

105 Schelter Road
Lincolnshire, Illinois 60069
Phone 847 821 7667
Fax 847 821 8570

Form **LLC-5.25**

Illinois
Limited Liability Company Act
Articles of Amendment

FILE #: 0458194-6

Secretary of State
Department of Business Services
Limited Liability Division
501 S. Second St., Rm. 351
Springfield, IL 62756
217-524-8008
www.cyberdriveillinois.com

Filing Fee: $150
Approved By: **TLB**

FILED
Apr 13, 2015
Jesse White
Secretary of State

1. Limited Liability Company Name:

   PASSION FOR POLO LLC

2. These Articles of Amendment are effective on the file date.

3. The Articles of Organization are amended to change the name of the limited liability company as follows:

   New Name:

   CAUTHORN FARMS, LLC

4. This amendment was approved in accordance with Section 5-25 of the Illinois Limited Liability Company Act, and, if adopted by the managers, was approved by not less than the minimum number of managers necessary to approve the amendment, member action not being required; or, if adopted by the members, was approved by not less than the minimum number of members necessary to approve the amendment.

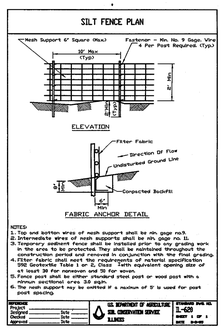
5. I affirm, under penalties of perjury, having authority to sign hereto, that these Articles of Amendment are to the best of my knowledge and belief, true, correct and complete.

Dated Apr 13 (Month/Day) , 2015 (Year)

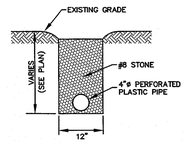
JAN-DIRK LUEDERS
Signature of Member

Name and Title
If the member or manager signing this document is a company or other entity, state Name of Company and whether it is a member or manager of the LLC.

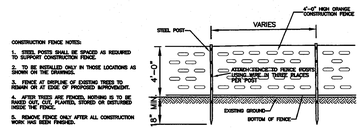
SEPTIC SYSTEM DESIGN



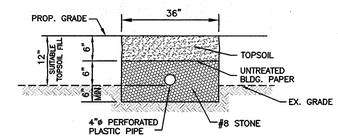
CURTAIN DRAIN



TREE PROTECTION & CONSTRUCTION FENCE DETAIL



TRENCH DETAIL



NOTE

FILL SEPTIC FIELD AREA TO MATCH PROPOSED FINISH CONTOURS. USE ONLY POROUS TOPSOIL CONTAINING LESS THAN 30% CLAY. FILL SHALL EXTEND 10 FEET BEYOND TRENCHES THEN SLOPE AT 3:1 MAX. PREPARE SITE BY PLOWING WITH A "MOLD BOARD" PLOW. HANDLE AND GRADE FILL ONLY WHEN BOTH THE SITE AND FILL ARE DRY. USE A SWAMP TYPE DOZER WHICH EXERTS MINIMUM PRESSURE ON THE FILL.

DESIGN CRITERIA

SUMMARY OF ANTICIPATED WATER USEAGE

DAY WORKERS : 2 PEOPLE	2 X 20 G.P.D.	=	40 G.P.D.
POLO PLAYERS W/KITCHEN & SHOWER USE : 10 PEOPLE	10 X 20 G.P.D.	=	200 G.P.D.
POLO SPECTATORS W/KITCHEN USE : 10 PEOPLE	10 X 15 G.P.D.	=	150 G.P.D.
TOTAL			390 G.P.D.

PROPOSED FIELD

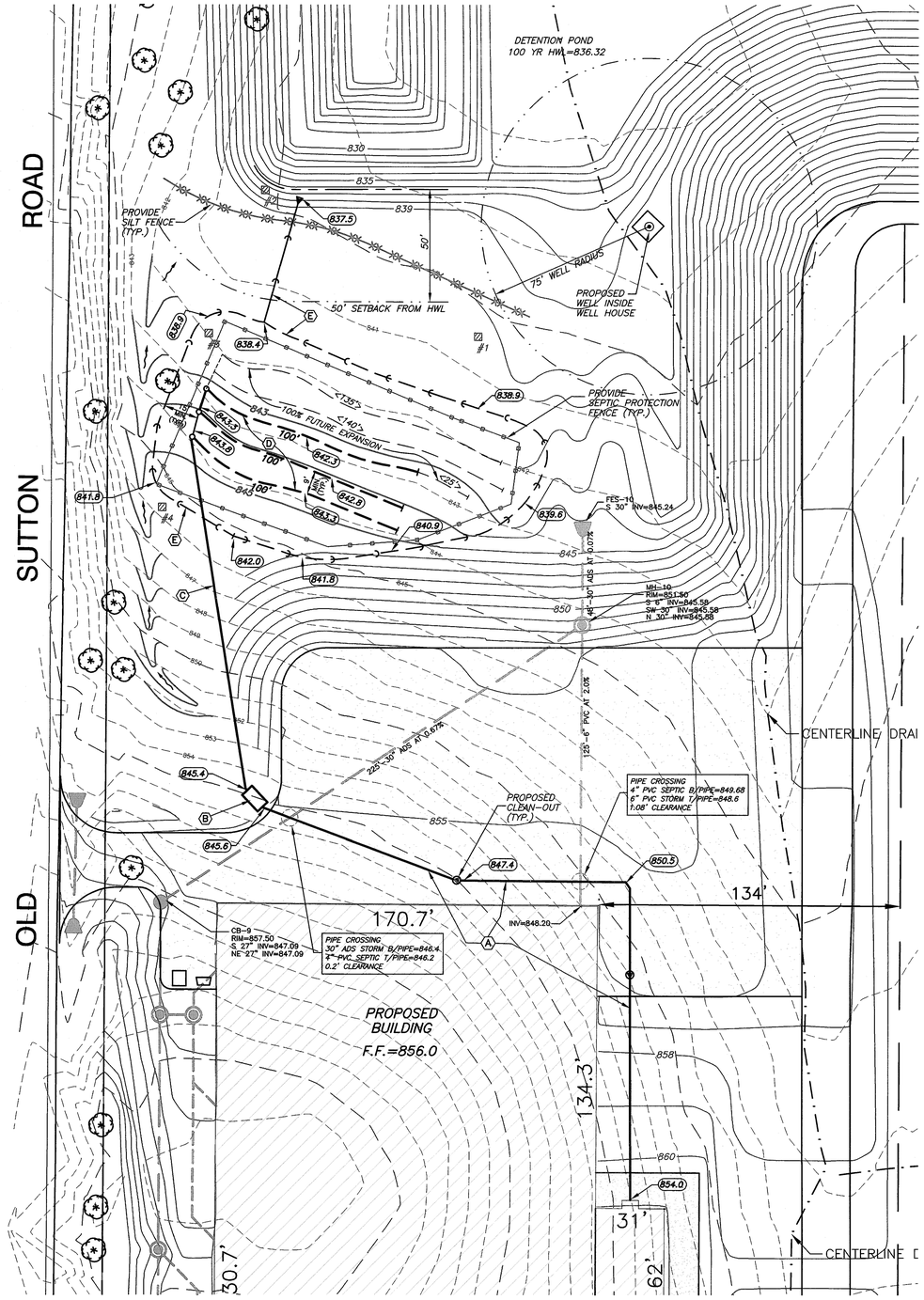
TRENCH LOADING RATE : 0.52 G.P.D./S.F. X 3 FT. = 1.56 G.P.D./L.F.

FIELD REQUIRED : 390 G.P.D. / 1.56 G.P.D./L.F.

= 250 L.F. (300 L.F. PROVIDED)

FUTURE SEPTIC SYSTEM REPLACEMENT FIELD

= 300 L.F. PROVIDED



THIS DRAWING IS FOR SEPTIC SYSTEM DESIGN ONLY. REFER TO SITE PLAN DRAWING(S) BY OTHERS FOR ALL OTHER ENGINEERING/SITE PLAN RELATED INFORMATION.

THE EXISTING TOPOGRAPHIC INFORMATION SHOWN HEREON WAS PROVIDED TO HLC BY SOOS ARCHITECTS FOR THE PURPOSE OF THIS SEPTIC SYSTEM DESIGN.

LEGEND

- (A) = 305 L.F. – 4" ø P.V.C. (SCHED #80) W/SEALED JOINTS AT 2.0% MIN.
- (B) = 1500 GALLON SEPTIC TANK
- ◯ = _____ GALLON CLASS 1 AEROBIC UNIT (CLEARSTREAM, MULTI–FLO, OR EQUAL)
- (C) = 160 L.F. – 4" ø P.V.C. (ASTM 3034) AT 1.0% MIN. SLOPE
- ⬡ = _____ LIFT STATION (SEE DETAIL)
- ⬡ = _____ L.F. – 2" ø SOLID PLASTIC DISCHARGE PIPE.
- (D) = 300 L.F. SEPTIC FIELD 4"ø PERFORATED PLASTIC PIPE LAID LEVEL IN 36" WIDE TRENCHES. 20" DEEP. USE APPROVED DROP BOXES.
- (E) = 451 L.F. CURTAIN DRAIN AND 55 L.F. 4"ø SOLID PLASTIC PIPE. PITCH DOWNHILL AT 0.3% MIN. SLOPE AND DISCHARGE TO SEWER LINE. CONNECT ALL GUTTER DOWNSPOUTS AND FOOTING TILE SUMP PUMP TO CURTAIN DRAIN.
- ⬭ = PROPOSED PIPE INVERT ELEVATION
- ▨ = SOIL PROFILE BORING
- ~ = PROPOSED FINISH CONTOUR
- ~ = EXISTING CONTOUR
- –XX–XX– = SILT FENCE
- –o–o– = SEPTIC PROTECTION FENCE

SPECIAL NOTES

THIS DESIGN IS BASED UPON (1) THE FIELD CONDITIONS AS THEY WERE ON THE DAY THE PERCOLATION TEST OR TYPING, AND/OR TOPOGRAPHIC INFORMATION WERE OBTAINED, AND (2) DATA FURNISHED BY THE OWNER OR GENERAL CONTRACTOR OR THEIR REPRESENTATIVE – REGARDING BUILDING SIZE, NUMBER OF BEDROOMS, AND/OR PEOPLE WITHIN THE UNIT TO BE SERVED.

ANY DEVIATIONS FROM THESE DESIGN CONDITIONS SUCH AS (1) CHANGING THE NUMBER OF BEDROOMS AND/OR PEOPLE TO BE SERVED, (2) REDUCING THE PERCOLATION CAPACITY OF THE SOILS – BY RUNNING HEAVY EQUIPMENT OVER, OR STOCK PILING BUILDING MATERIAL OR EXCAVATED SOIL ON THE SEEPAGE FIELD AREA, (3) REDUCING THE EFFECTIVE SEEPAGE FIELD BY – SIGNIFICANTLY CHANGING, ACTUALLY REDUCING, OR COVERING THE SEEPAGE FIELD WITH PAVEMENT, (4) DIVERTING GROUND WATER INTO OR OVER THE SEEPAGE FIELD, OR (5) INTRODUCING OILS AND/OR GREASES INTO THE SEEPAGE FIELD – WILL VOID THIS DESIGN.

GENERAL NOTES

1. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES, AND HAVE ALL EXISTING UTILITY INSTALLATIONS LOCATED AND STAKED PRIOR TO CONSTRUCTION.

2. ALL BACKFILL USED FOR THE SEEPAGE FIELD TRENCHES SHALL BE POROUS TOPSOIL CONTAINING LITTLE OR NO CLAY.

3. THE CONTRACTOR SHALL VERIFY ALL EXISTING FIELD CONDITIONS SUCH AS WELL LOCATIONS, HOUSE AND ANY EXISTING SEPTIC FIELD LOCATIONS, ALL ELEVATIONS PRIOR TO INITIATING ANY CONSTRUCTION.

4. ALL DOWNSPOUTS AND SUMP PUMP SHALL DISCHARGE AWAY FROM THE SEEPAGE FIELD, OR INTO A CURTAIN DRAIN.

5. ALL INSTALLATIONS SHALL CONFORM TO THE APPROPRIATE REGULATORY AGENCY REQUIREMENTS.

6. PRIOR TO THE START OF ANY BUILDING CONSTRUCTION ACTIVITY A TEMPORARY FENCE SHALL BE CONSTRUCTED AROUND THE PROPOSED SEEPAGE FIELD AREA.

7. NO SEEPAGE FIELD CONSTRUCTION, OR PLACING OF TOPSOIL IS PERMITTED UPON WET OR FROZEN GROUND.

8. NO LAWN IRRIGATION SYSTEMS MAY BE INSTALLED WITHIN 25' OF THE SEPTIC SEEPAGE FIELD AREA.

9. SEPTIC CONTRACTOR IS TO NOTIFY DESIGN ENGINEER AND VILLAGE REPRESENTATIVE 48–HOURS IN ADVANCE OF CONSTRUCTION TO REVIEW AND INSPECT INSTALLATION PRIOR TO COMMENCEMENT OF ANY BACKFILLING.

VILLAGE OF BARRINGTON HILLS NOTES

1. THE DESIGN ENGINEER SHALL APPROVE THE LAYOUT OF THE SEPTIC SYSTEM INSTALLATION PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION.

2. THE DESIGN ENGINEER AND VILLAGE REPRESENTAITVE SHALL REVIEW THE SEPTIC SYSTEM INSTALLATION PRIOR TO COMMENCEMENT OF ANY BACKFILLING.

3. THE INSTALLER SHALL NOTIFY THE DESIGN ENGINEER OF THE PRECISE TIME SCHEDULE FOR THIS PROJECT 2 DAYS IN ADVANCE OF INITIATING ANY CONSTRUCTION, AND SHALL UPDATE THE ENGINEER OF ANY DELAYS DUE TO WEATHER.

4. THE CONTRACTOR SHALL PROVIDE QUALIFIED PERSONNEL TO INSPECT THE SITE IN ACCORDANCE WITH THE CONDITIONS OF THE PERMIT. SPECIFICALLY, AT LEAST ONCE EVERY 7 CALENDAR DAYS, AND WITHIN 24 HOURS OF THE END OF A STORM THAT IS 0.5 INCHES OR GREATER, OR EQUIVALENT SNOWFALL. THE CONTRACTOR SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE. RECORDS SHALL BE KEPT ON FILE WITH THE CONTRACTOR AND SHALL BE MADE AVAILABLE TO THE VILLAGE UPON REQUEST.

RECEIVED
APR 10 2015
VILLAGE OF BARRINGTON HILLS
BUILDING DEPARTMENT

SEPTIC SYSTEM DESIGN PREPARED BY AND/OR UNDER THE DIRECT SUPERVISION OF :

PEDER A. FINNBERG, P.E.
LICENSED PROFESSIONAL ENGINEER
ILLINOIS NO. 62–28834
EXPIRES : 11–30–15

PEDER A. FINNBERG 62-28834 4/7/15 ILLINOIS

NOTE:
EXISTING UTILITIES: WHEN THE PLANS OR SPECIAL PROVISIONS INCLUDE INFORMATION PERTAINING TO THE LOCATION OF UNDERGROUND UTILITIES SUCH INFORMATION REPRESENTS ONLY THE OPINION OF THE ENGINEER AS TO THE LOCATION OF SUCH UTILITIES AND IS ONLY INCLUDED FOR THE CONVENIENCE OF THE BIDDER. THE ENGINEER AND OWNER ASSUME NO RESPONSIBILITY WHATSOEVER IN RESPECT TO THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS RELATIVE TO THE UNDERGROUND UTILITY FACILITIES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN FROM THE RESPECTIVE UTILITY COMPANIES, DETAILED INFORMATION RELATIVE TO THE LOCATION OF THEIR FACILITIES.

CONTRACTOR IS RESPONSIBLE FOR CONTACTING J.U.L.I.E. AT 1–800–892–0123 AND MUST OBTAIN A DIG NUMBER AT LEAST 72 HOURS PRIOR TO ANY WORK BEING DONE.

HLC SEPTIC DESIGN IS A SERIES OF HERITAGE LAND CONSULTANTS, LLC, AN ILLINOIS LIMITED LIABILITY COMPANY.

ILLINOIS PROFESSIONAL LAND SURVEYOR AND PROFESSIONAL ENGINEERING DESIGN FIRM CORPORATION LICENSE NO. 184.004955 EXPIRES : 04–30–2015

IT'S CALL J.U.L.I.E. 1-800-892-0123 DIGGERS HOTLINE, INC. TOLL FREE

PASSION FOR POLO - SEPTIC SYSTEM DESIGN
170 Old Sutton Road, Barrington Hills Cook County, IL

PAF SEPTIC DESIGN

SCALE: 1" = 30'
DATE: 4–7–2015
DRAWN BY: MWR
CHECKED BY: PAF
JOB NUMBER: 2015–037 SEP

DISK: 150403 FILE NM. 150375EP FILE NM. N/A PAC. NO. N/A

CLIENT: SOOS & ASSOCIATES / ROBERT SOOS
ADDRESS: 170 OLD SUTTON ROAD / BARRINGTON HILLS, IL

HERITAGE LAND CONSULTANTS LLC
Surveying Engineering Septic Design
HLC SEPTIC DESIGN
758 RIDGEVIEW DRIVE
McHENRY, ILLINOIS 60050
(815) 344-3252

GHA GEWALT HAMILTON ASSOCIATES, INC.
CONSULTING ENGINEERS
625 Forest Edge Drive, Vernon Hills, IL 60061
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MEMORANDUM

To: Robert Kosin, Village of Barrington Hills
Board of Health Members

From: Daniel J. Strahan, P.E., CFM
Gewalt Hamilton Associates

Date: April 10, 2015

Re: Septic Code Amendments

Based on discussions at the January 13, 2015 meeting of the Board of Health, our office submitted draft amendments to section 4-2-7 of the Village Code to the Illinois Department of Public Health. The amendments were proposed in order to make provisions in the ordinance for at-grade and mound septic systems as permitted systems based on the frequency of variances issued for such systems. A more complete background on the nature of these revisions prepared in October 2014 is attached.

We have received a response letter from IDPH indicating their pre-approval of the amendment text, subject to a few minor revisions. Those revisions have been made and a complete pdf document of the amendment text is included for reference and review. If so inclined, the Board of Health can make a recommendation to the Board of Trustees to approve the proposed amendments to the Village Code.

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The Monadnock Building, 53 W. Jackson Blvd., Suite 924, Chicago, IL 60604 ■ TEL 312.329.0577 ■ FAX 312.329.1942

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MEMORANDUM

To: Robert Kosin, Village of Barrington Hills
Board of Health Members

From: Daniel J. Strahan, P.E., CFM
Gewalt Hamilton Associates

Date: October 20, 2014

Re: At-grade & Mound Septic Systems

On January 1, 2014, a number of amendments to the Village septic ordinance went into effect as necessitated by amendments to the Illinois Department of Public Health (IDPH) Private Sewage Disposal Code. As anticipated, the elimination of the percolation test and the requirement of 24" separation from the limiting layer has had the result that for a number of properties a standard trench system cannot be approved as it could not meet this separation requirement. This has resulted in a number of variance requests to the Board of Health. At the September 9, 2014 meeting, the Board requested a review and recommendation from our office as to whether consideration of an amendment to the Village septic ordinance to allow such systems without a variance would be warranted.

Building Permit Applications -2014

Thus far in 2014, the Village has received six building permit applications that have required a full septic system design and were subject to the ordinance amendments. These have included three applications for new single family residences, one residential addition, and two replacement septic system designs. Of these six applications received, five have included a request for variance to the Board of Health for an at-grade or mound system, including a request on the agenda for the October meeting. Four of the five variance requests have come from properties in Cook County and one has come from a property in McHenry County.

County Records

As the sample size within the Village is relatively small, our office requested and received installation records from Lake and McHenry County to determine the frequency of mound and at-grade septic systems in neighboring areas. These two counties were chosen as they had already eliminated the use of percolation tests for septic designs prior to the IDPH ordinance amendments and both allow mound systems. Records were provided in Lake County for 2013, while McHenry County provided records from 2012 and 2013.

The report provided by the Lake County Health Department indicates that a majority of systems permitted in 2013 were mound systems. Excluding septic tank replacements and other permits that would not involve soil absorption, Lake County received 48 permit applications that involved septic design in 2013. Thirty five (35) of these applications were for mound systems, representing 72.9% of all applications received.

McHenry County is generally considered to have more granular, better drained soils than Lake County, and the septic installation records are reflective of these soils. Excluding septic tank replacements and other permits that would not involve soil absorption, McHenry County received 64 permit applications that involved septic design in 2012. Five of these were for mound systems, representing 7.8% of the applications received. Mound systems were even rarer in 2013, accounting for just one out of the 62 applications approved, or 1.6%.

Recommendations

Based on the applications received to date and soil conditions observed in the Village, we anticipate a significant percentage of building permit applications in the future would require a variance. There are very few foreseeable conditions under which such a variance would not be granted. In the case of a septic replacement, the lack of a proper septic system would render an existing house uninhabitable. Similarly, in the case of new construction a property is not buildable without an approved septic system.

As mound septic systems have been an approved technology in Northeast Illinois for over twenty years and such systems are likely to be a routine design feature due to the new state requirements, we would recommend that the Village Code include some consideration for at-grade and mound systems as an approved system. At the same time, the Village of Barrington Hills has traditionally emphasized non-mechanical forms of sewage disposal which require less maintenance. As evidenced by the county statistics provided and our experience with soil conditions in the Village, soil suitability can change significantly from location to location. With residential properties five acres or greater, that variation can sometimes occur within a given property. As a result, we would recommend the following criteria for consideration of mound septic systems:

- For new construction and tear-down/reconstruct permits, where initial soil testing indicates an at-grade or mound system would be required, soil mapping should be prepared for the remainder of the property to verify that there are no options to install a trench system. This should also include criteria to consider what a reasonable distance would be for this soils review; if suitable soil exists on the property but is over 300’ away from the residence, for instance, consideration could be given to allow an at-grade or mound system at a location more accessible to the house.
- For replacement systems, mound and at-grade systems should be approved without any additional soil testing. Such permits are typically much more time and cost sensitive as they result from a failed or failing system.

As the Village septic code remains subject to IDPH requirements, any proposed amendment to the ordinance should start with a review and preliminary approval by the state. If the Board concurs with the general approach outlined above, we would suggest the following schedule:

- November 2014- GHA to draft proposed amendments to section 4-2-7 of the Village Code and review with IDPH.
- December 2014- Preliminary review of ordinance amendment by the Board of Health.
- January 2015- Recommendation of ordinance amendment by the Board of Health and approval by the Village Board of Trustees.

IDPH
ILLINOIS DEPARTMENT OF PUBLIC HEALTH

525-535 West Jefferson Street • Springfield, Illinois 62761-0001 • www.dph.illinois.gov

April 1, 2015

Dan Strahan,
Gewalt Hamilton Associates, Inc.
625 Forest Edge Drive
Vernon Hills, IL 60061

Dear Mr. Dan Strahan:

The Department has reviewed the proposed draft language to the Section 4-2-7: Private Sewage Disposal:, of the Village of Barrington Hills Ordinance. The proposed draft language appears to be satisfactory. There are only three things that need to be clarified or corrected they are as follow:

1.) Section (H) Soil Treatment, (4) Design Requirements for At-Grade Systems,
(c) Distribution to… and Section ????? (Provide section number.)

2.) Section (H) Soil Treatment, (5) Design Requirements for Mound Systems,
(c) Distribution to… and Section ????? (Provide section number.)

3.) Section (H) Soil Treatment, (10) (d) Fill:
(2) ….plan and shall ~~shlal~~ be placed immediately after site preparation.

After the proposed draft language to the ordinance is approved by the Village Board, please forward an official signed and dated copy to me for the Departments final review and approval.

If you have additional questions, please contact me at the Division of Environmental Health at 217-524-4137or chad.moorman@illinois.gov.

Sincerely,

Chad Moorman, LEHP
Program Manager
Private Sewage Disposal Program

cc: West Chicago Regional Office

4-2-7: PRIVATE SEWAGE DISPOSAL:

(A) Purpose: It is the purpose of this Section to ensure the adequacy, proper location, and proper construction of septic systems in order to protect the public health, safety and general welfare.

(B) Applicability and Prohibition: This Section shall apply to all sewage and drainage systems and facilities located within the Village. It shall be unlawful and a violation of this Title of the Village Code to perform any work subject to this Section, or to install, use or maintain any facility or system subject to this Section except in strict compliance with the provisions and appendices of this Section and the provisions of all other applicable laws, ordinances, rules and regulations of the Village and of other governments and agencies having jurisdiction.

(C) Definitions: The following definitions shall apply to this Section:

1. "AEROBIC TREATMENT PLANT" means equipment or devices for the treatment of sewage by the forced addition of air or oxygen.

2. "APPROVED or APPROVAL" means accepted by or acceptable to the Village except as the context shall explicitly indicate accepted by or acceptable to the Illinois Department of Public Health.

3. "BEDROOM" means, for the purpose of establishing the rate of flow for domestic sewage, any room, whatever named, which is easily suitable for use regularly as a room for sleeping, including, but not limited to, a den or study.

4. "BUILDING SEWER" means that part of the horizontal piping of a drainage system which extends from the end of the building drain, receives the discharge of the building drain and conveys it to a private sewage disposal system or another approved point of disposal. The building sewer commences five feet (5') outside the building foundation wall.

5. “CLASS I AEROBIC TREATMENT UNIT” means a mechanical wastewater treatment unit classified, listed and labeled as Class I by an ANSI accredited third-party testing and certification organization and certified compliant with the International Organization for Standardization (ISO)/International Electrochemical Commission (IEC) Guide 65 to determine compliance with the requirements of NSF ANSI Standard 40 for wastewater treatment systems.

6. “COARSE SAND” means fill material having an effective diameter of 0.15 to 0.33 mm with a coefficient of uniformity <5.0, and having less than 20% material coarser than 2 mm and less than 5% silt and clay.

~~5~~7. "COUNTY" means any one of four (4) Counties, Cook, Kane, Lake and McHenry in the State of Illinois.

~~6~~8. "CURTAIN DRAIN" means a drainage system designed and constructed to intercept and accept surface and ground water which, were it not for such a system, would travel onto or into the subsurface seepage system of the private sewage disposal system.

~~7~~9. "DEPARTMENT" means the Illinois Department of Public Health.

~~8~~10. "DOMESTIC SEWAGE" means waste water derived principally from dwellings, businesses or office buildings, institutions, food service establishment, and similar facilities.

~~9~~11. "EFFECTIVE SIZE" means the size of screen opening where ninety percent (90%) by weight of a sample of filter media is retained on the screen and ten percent (10%) passes through the screen.

12. “FLOW CONTROL DEVICE” means a device specially designed to equalize the outflow elevation of effluent from a distribution box, typically a rotating pipe cap provided with an off center outflow orifice that can adjust the flow line by rotation of the cap.

~~10~~13. "HUMAN WASTES" means undigested food and by-products of metabolism which are passed out of the human body as may be indicated by the presence of human fecal coliform-group bacteria.

~~11~~14. “LIMITING LAYER” means a horizon or soil condition in the soil profile or underlying strata that includes:

An estimated high water table, whether perched or regional.

Masses of loose rock fragments, including gravel, with insufficient fine soil to fill the voids between the fragments.

Rock formation, other stratum or soil condition that is so slowly permeable that it effectively limits downward passage of effluent.

~~12~~15. "LIQUID CAPACITY" means the volume of a tank below the invert of the outlet line.

~~13~~16. “MAINTAINED AND SERVICED” means the tasks, procedures, and inspections required by the manufacturer of the component/system or the Village for the private sewage disposal system to operate within the parameters and requirements of this Section and any other restrictions established as part of the system approval or as part of a variance.

~~14~~17. "NSF" means the National Sanitation Foundation, an independent testing laboratory.

~~15~~18. "PERSON" means any individual, group of individuals, association, trust, partnership, corporation, person doing business under an assumed name, the State of Illinois or any Department thereof, or any other entity.

~~16~~19. "POPULATION EQUIVALENT" means an average waste loading equivalent to that produced by one person which is defined as one hundred (100) gallons per day.

~~17~~20. "PRIVATE SEWAGE DISPOSAL SYSTEM" means an on-site, soil absorption treatment facility for domestic sewage, commonly referred to as a septic system, which is designed, constructed, operated and maintained in accordance with this Section. When used with this definition, the word "NEW" means any such system installed after the effective date of this Section.

~~18~~21. "PRIVATE SEWAGE DISPOSAL SYSTEM CONTRACTOR" means any person engaged in the business of constructing, installing, maintaining, servicing, or cleaning of private sewage disposal systems or the hauling or disposal of wastes removed therefrom.

~~19~~22. "PROPERTY OWNER" means the person in whose name legal title to the real estate is recorded.

~~20~~23. "REPAIR" means the construction necessary to correct prohibited discharges or improve an existing private sewage disposal system which fails by operation or design to be in compliance with this Section.

~~21~~24. "SEPTAGE" means the solid and liquid wastes removed from private sewage disposal systems.

~~22~~25. "SHALL" means the stated provision is mandatory.

~~23~~26. “SOIL BORING” means an observation pit, dug by hand or backhoe, or an undisturbed soil core taken intact and undisturbed by a probe.

~~24~~27. “SOIL CLASSIFIER” means one of the following:

A Certified Professional Soil Classifier (CPSC who is certified by the Illinois Soil Classifiers Association (ISCA) or a certified soil classifier with the American Registry of Certified Professionals in Agronomy, Crops, and Soils (ARCPACS).

A person who is a full member or associate member of the Illinois Soil Classifiers Association (ISCA), provided that direct supervision is provided to this person by an ISCA Certified Professional Soil Classifier or ARCPACS certified soil classifier who accompanies the person on at least 25% of the soil investigations and reviews and signs all of that person’s soil investigation reports.

28. “SOIL LOADING RATE” means the maximum rate, based upon a soil’s texture structure and consistence and expressed as gallons per square foot (gpd/ft^2) of infiltration area, at which effluent may be applied to a soil treatment system.

~~25~~29. "SUBSURFACE SEEPAGE SYSTEM" means all approved components of a subsurface seepage field, seepage bed, chamber system or buried sand filter.

~~26~~30. "UNIFORM COEFFICIENT" means a number obtained by dividing that size of sand in millimeters of which sixty percent (60%) by weight is smaller, by that size of sand in millimeters of which ten percent (10%) by weight is smaller.

~~27~~31. "VILLAGE" means the Village of Barrington Hills in the Counties of Cook, Kane, Lake and McHenry, State of Illinois.

~~28~~32. "WASTE" means either human waste or domestic sewage or both.

~~29~~33. "WATER TABLE" means the upper limit of the portion of the soil or rock formation that is completely saturated with water.

(D) General Requirements: Every private sewage disposal system shall be designed, constructed, operated and maintained in accordance with the minimum standards as specified in the following regulations.

1. Rate of Flow for Domestic Sewage: Each unit of the private sewage disposal system shall be designed to treat the volume of domestic sewage and human wastes discharged to it.

a. Volume Design Requirements: The volume of sewage flow shall be determined in accordance with Appendix A of this Section. For non-residential establishments, the Building Officer will consider, in addition to the methods set out in Appendix A of this Section, the use of documented flow volumes obtained from similar installations. Flows shall conform with subsection (D)7 of this Section unless approval has been obtained from the Illinois Environmental Protection Agency and the Village.

b. Additions or Enlargements: In terms of the permit issued therefor, any change to the volume of sewage flow to that system shall constitute a repair situation and be corrected in compliance with this Section.

c. Credit for Existing Systems: For new construction or the addition of one or more bedrooms that will utilize an existing septic system, credit will be assigned based on the age and use of the existing seepage field upon the date of the building permit application. For existing systems less than 10 years old, 100% credit is assigned to the length of distribution lines in place. For existing systems less than 20 years old but greater than 10 years old, 50% credit is assigned to the length of distribution lines in place, unless an inspection of the existing system by the Village Health Officer warrants that additional credit can be assigned; up to 100% credit can be assigned for systems less than 20 years old. For existing systems greater than 20 years old, no credit is assigned to the length of the distribution lines in place; up to 50% credit can be assigned based on an inspection of the existing system by the Village Health Officer.

d. Credit for Existing Chamber Systems: For new construction or the addition of one or more bedrooms that will utilize an existing chamber septic system, credit will be assigned based on the age and use of the existing chamber system upon the date of the building permit application. For existing chamber systems less than 15 years old, 100% credit is assigned to the length of distribution lines in place. For existing chamber systems less than 30 years old but greater than 15 years old, 50% credit is assigned to the length of distribution lines in place, unless an inspection of the existing chamber system by the Village Health Officer warrants that additional credit can be assigned; up to 100% credit can be assigned for systems less than 30 years old. For existing systems greater than 30 years old, no credit is assigned to the length of the distribution lines in place; up to 50% credit can be assigned based on an inspection of the existing chamber system by the Village Health Officer."

2. Type of Waste: A private sewage disposal system shall be designed to receive and treat only domestic sewage. No cooling water, groundwater, discharges from roof drains, footing tile drains, water softeners nor swimming pool wastewater, or other clear water discharges shall be directed to the private sewage disposal system. No automotive grease, oil, toxic wastes, nor any waste other than domestic and human wastes shall be discharged to a private sewage disposal system. Wastes from floor drains in areas where vehicles or motorized equipment are serviced and parked shall be connected to a holding tank. The holding tank shall be constructed of the same materials required for gas and oil interceptors meeting the requirements of Section 890.25 of the Illinois Plumbing Code.

3. Individual Service: A private sewage disposal system shall serve only the lot on which the system is located.

4. Water and Sewer Line Separation: The following criteria shall govern the separation of water supply lines and sewer lines.

a. Horizontal Separation: Sewers shall be installed at least ten feet (10') horizontally from any existing or proposed water line. When site conditions prevent a lateral separation of ten feet (10'), a sewer may be laid closer than ten feet (10') to a water line provided that the elevation of the crown of the sewer is at least eighteen inches (18") below the invert of the water line.

b. Crossings: Where sewer lines must cross water lines, the sewer line shall be laid at such an elevation that the crown of the sewer line is at least eighteen inches (18") below the invert of the water line. This vertical separation shall be maintained for that portion of the sewer line located within ten feet (10') horizontally of any water line it crosses. When sewer lines must cross above water lines, the sewer lines shall be Schedule 40 or equivalent material and with water tight joints.

5. Acceptable Pipe Materials: All piping located more than five feet (5') from the building foundation, used to convey wastewater to a private disposal system, shall be considered a part of the private sewage disposal system. All piping located from a point five feet (5') from the building foundation to a point six feet (6') beyond the septic tank (or distribution box where used) shall be ductile iron, vitrified clay, asbestos cement, or plastic pipe. Perforated pipe or open-jointed tile shall be used only as provided in this Section.

a. Plastic Pipe Materials: Plastic pipe, and fittings utilized in private sewage disposal system shall be manufactured from the list of approved materials specified in Appendix B of this Section in accordance with the latest revision of the materials standard indicated.

b. Use of Plastic Pipe: Use of plastic pipe shall conform to the uses designated in Appendix C of this Section.

6. Pipe Size and Slope: All solid pipes carrying gravity flow shall have an inside diameter of at least four inches (4") and a minimum slope of twelve inches (12") per hundred feet (100'). Building sewers in excess of 50 feet in length shall be provided with at least one clean-out every 50 feet that terminates at grade.

7. Prohibited Discharge: There shall be no discharge of domestic sewage or septage from any building sewer or private sewage disposal system to the surface of the ground or to farm tiles, streams, rivers, ponds, lakes, or other collectors of water, nor to wells, cisterns, caves, tunnels or other such underground spaces.

8. Water Softener Wastewater. Backwash water from a water softener or similar device shall be discharged to one of the following:

a. A separate subsurface seepage system, provided that the seepage field is designed to accommodate the liquid capacity of the water softener on a daily basis. A septic tank is not required in front of a seepage field received flow from this device.b. A separate building drain, in accordance with the Illinois Plumbing Code, that will discharge to a subsurface seepage system, provided that the seepage field is designed to accommodate the flow from this device on a daily basis. A septic tank is not required in front of a seepage field receiving flow from this device.

9. Private Sewage Disposal System Development: The following factors shall govern the location and design of a private sewage disposal system:

a. Soil: The area of a subsurface seepage system shall be sized based upon the absorption capacity of the soil. Soil Investigations, prescribed in subsection (H) of this Section shall determine the absorption capacity of the soil.

(1) Each soil profile description shall be classified to establish a soil resource group, soil series or classification, the depth to a limiting layer and observed water, if present.

(2) Each soil profile description shall assign maximum wastewater loading rates segregated by horizon. Each segregated horizon shall be assigned a loading rate between 0 gallons per day per square foot (gpd/ft^2) and 1.0 gpd/ft^2.

(3) The soil located in an proposed primary or reserve soil treatment area must not be seasonally saturated to within 12" of the ground surface.

b. Drainage: A private sewage disposal system shall not be located in areas of flooding, ponding, surface water or where the limiting layer is within two feet (2') of the bottom of the trench or bed. Curtain drains shall be used to minimize surface and ground water in the area of the subsurface seepage system.

c. Water Table: Subsurface seepage systems shall not be constructed in areas where the groundwater table is within four feet (4') of the bottom of the trench or the bed.

d. Limestone Formations: A subsurface seepage system shall not be constructed in an area where there is less than four feet (4') of soil between the lowest point in a subsurface seepage system and the top of a creviced limestone formation. In areas where creviced limestone is known to occur, a soil boring or backhoe excavation to a depth of at least four feet (4') below the bottom of the subsurface seepage system shall be made.

e. Topography: The existing grade elevation and vegetation, especially mature trees, shall be accommodated in the layout of the subsurface seepage system. Every effort should be made to minimize the alteration of the topography without jeopardizing the functional capability of a private sewage disposal system.

f. Distances: The location of the various components of a private sewage disposal system shall comply with Appendix D of this Section so that no component shall be closer than the distances stated to the various features. The distance shall be increased where required by the other factors in this subsection (D) of this Section peculiar to a specific location.

g. Area Reserved for Sewage Disposal: The area to be used for a private sewage disposal system and the reserved seepage field shall be selected and maintained so that it is free from encroachment by accessory buildings, driveways, parking spaces, swimming pools, tennis courts, underground utility services, pastures, patios, slabs, additions to the original structure, or any other structure that limits free access to the system for maintenance, servicing, or proper operation. The property owner and private sewage disposal system installation contractor shall ensure that the designated area for the subsurface seepage system shall be secured prior to construction or modifications to the site and shall be protected throughout the site development process. The property owner and private sewage disposal system installation contractor shall secure this area to deter any traffic, compaction of soil, removal or addition of soil, or encroachment on the area of the proposed subsurface seepage system. Temporary fencing or a similar restrictive barrier may be used to restrict

access. The area of the proposed private sewage disposal system shall be protected throughout the site development or construction process.

10. Electrical Devices. All electrical devices shall be wired in accordance with the National Electrical Code or local electrical code, whichever is more stringent.

    a. Any component of a private sewage disposal system which is electrically activated shall be provided with a conspicuously visible and audible warning device.

    b. Alarms installed after January 1, 2014 shall be located outside of the building served. The power supply for the alarm shall be on a dedicated circuit. The design of the alarm shall meet the requirements specified in Section 5.8 of NSF International/ANSI Standard 40. The alarm shall be housed in a weatherproof box.

    c. Electrical devices installed after January 1, 2014 shall be provided with an electrical disconnect that is located within sight of, and not more than 50 feet away from, the device.

11. Variances: In order to address contingencies or provide relief to practical difficulties, the provisions and appendices of this Section may be varied in accordance with the specific instances hereinafter set forth:

    a. New Private Sewage Disposal Systems: Upon a determination by the Building Officer that the installation of a new private sewage disposal system cannot be accomplished in compliance with the provisions and appendices of this Section, the applicant may seek a variance in accordance with the procedures and standards set forth in subsection 6-3-5(C) of the Village Code. (Ord. 84-4, 3-26-84)

    b. Repairing Private Sewage Disposal System: A variance from the provisions and appendices of this Section, if needed for the repair of a private sewage disposal system, may be granted or denied by the Building Officer, with an appeal to the Board of Health. The Building Officer may approve variances allowing up to one foot of fill material over existing ground to accommodate an otherwise standard trench system. Variances requesting more than one foot of fill or an alternate system type may only be approved by the Board of Health. However, no variance shall be granted unless the applicant satisfactorily demonstrates its said variance is necessary for the system to comply with the purpose of this Section. (Ord. 92-8, 4-27-92)

12. Detached guesthouses: Septic systems serving detached guesthouses having less than three bedrooms shall be designed in accordance with the minimum requirements for a primary residence.

(E) Approved Private Sewage Disposal System:

1. General: A septic tank or Imhoff tank followed by a subsurface seepage system, as described in subsections (F), (G) and (H), of this Section is approved for private sewage disposal when designed, constructed, operated, and maintained in accordance with this Section. No other system or component is approved, including but not limited to aerobic treatment plants.

2. Repair: Any system or component thereof approved pursuant to subsection (E)1 hereof is approved for use in repairs. In addition, an aerobic treatment plant discharging to a subsurface seepage system as provided in subsection (J) of this Section may be used for the

repair of a private sewage disposal system only when a variance has been issued pursuant to subsection (D)11 of this Section.

(F) Septic Tanks:

1. Septic Tank Approval: Manufacturers of prefabricated septic tanks shall submit three (3) sets of plans for each size and configuration of septic tank to the Department for approval. Such plans shall be drawn to scale and show all dimensions, baffles, tees, cleanouts, and material specifications. A written approval for each size tank shall be provided by the Department when the plans are found to conform to the requirements of this Section.

   a. The Department shall issue an approval number to each manufacturer for each series of approved septic tanks, and shall maintain a listing of the approved manufacturers and approved septic tank series.

   b. No prefabricated septic tank shall be sold, offered for sale, or installed other than those which have been approved by the Department. The tank shall bear the manufacturer's approval number and the liquid capacity of the tank, in gallons, prominently displayed on the outside end wall of the tank above, or next to, the outlet pipe so that this information is readily visible after installation and prior to covering.

2. Septic Tank Construction: Septic tanks shall be designed and constructed in accordance with Appendix E of this Section and the following:

   a. A septic tank shall be watertight and constructed of sound and durable materials not subject to excessive corrosion, decay, frost damage, or cracking due to settling or back-filling.

   b. The tank shall support a top-dead load of not less than five hundred (500) pounds per square foot, and concrete tanks shall have a minimum twenty eight (28) day compressive strength of three thousand (3,000) pounds per square inch (psi).

   Tanks shall be designed and constructed so that they will not collapse or rupture when subject to anticipated earth and hydrostatic pressures when the tanks are either full or empty. The manufacturer, design engineer, and/or structural engineer shall certify in writing to the Department that the tank is designed and constructed to meet the load requirements of this Section. If additional loading is anticipated, the tank shall be strengthened to accommodate the additional loading.

   c. Materials: Septic tanks shall be constructed of the following approved materials:

      (1) Poured-in-place reinforced concrete.

      (2) Precast reinforced concrete.

      (3) Concrete block, provided that the core is filled with concrete and reinforcing rods are inserted in the core prior to pouring.

   d. Depth: The minimum liquid depth of the tank shall be forty two inches (42"), and the maximum liquid depth shall be seventy two inches (72").

   e. Inlet and Outlet Connections: The invert elevation of the inlet shall be at least two inches

(2") above the liquid level in the tank. The inlet and outlet openings of the septic tanks shall be provided with cast-in watertight openings.

f. Baffles: Septic tank baffles shall meet the following requirements:

(1) Inlet baffles shall be provided and shall extend at least six inches (6") below the surface of the liquid and to within at least three inches (3") of the tank lid.

(2) Outlet baffles shall be provided and shall be located no farther than six inches (6") from the outlet orifice. Outlet baffles shall extend to a depth of at least forty percent (40%) of the liquid depth. There shall be a clearance of at least one inch (1") of free space between the top of the tank and the baffles.

(3) Slip-in type baffles shall extend the full width of the tank.

(4) The sides of "V" or semi-circular type baffles shall fit tightly against the end wall of the tank.

(5) Venting shall be provided through all baffles and a free vent area equal to the cross-sectional area of the building sewer shall be provided.

(6) Submerged pipe T-branches or sanitary tees may be used at inlets and outlets in lieu of baffles, provided all of the above stated distances and depths are maintained. Submerged pipe T-branches used as inlet baffles shall be 6 inches in diameter or larger. Outlet baffles shall be 4 inches in diameter. Submerged pipe T-branches or sanitary tees shall meet the requirements of ASTM 2661, ASTM 2665, ASTM 3034, or ASTM 2751, provided that the pipe does not have an SDR (Standard Dimension Ratio) number greater than 35.

(7) When a single compartment septic tank is manufactured or used, a gas deflection baffle shall be provided below the outlet baffle of the tank configured to deflect rising gas bubbles away from the outlet structure and toward the interior of the tank. This baffle shall be constructed of a durable material not subject to corrosion or decay. An NSF International/ANSI Standard 46, Section 10 septic tank filter may be used in lieu of the gas deflector baffle. The septic tank filter baffle shall be installed so that it is extended or suspended to a depth equal to 40% of the liquid level of the tank. The tank access over the filter shall be provided with an access riser that extends to 3 inches above the ground surface or greater.

g. Access: Access shall be provided over the inlet and outlet of the tank to facilitate inspection and cleaning. The manhole or access opening shall have a fitted lid with a minimum dimension of 12 inches (width or diameter). Risers shall be watertight and constructed of a durable material. If the top of the tank is greater than 12 inches below the ground surface, a riser with a minimum dimension (width or diameter) of twelve inches (12") shall be provided by the private sewage disposal contractor at a height to bring access of the tank to the ground surface. If a 2- compartment tank is used, and the tank has an opening over the wall between the compartments, the center opening shall have access provided to the ground surface.

3. Capacity: Septic tanks for individual residences shall be sized in accordance with Appendix F of this Section. When the total flow exceeds one thousand three hundred fifty (1,350) gallons per day, two (2) or more tanks in series, or a multi-compartment tank, shall be installed.

Septic tanks for any establishment other than residential units shall be sized in accordance with the estimated flow provided in Appendix A of this Section, and as follows:

The volume below the liquid level for flows up to five hundred (500) gallons per day shall be at least seven hundred fifty (750) gallons. For flow greater than five hundred (500) gallons per day and less than one thousand five hundred (1,500) gallons per day, the volume shall be equal to at least one and one-half ($1^1/_2$) times the estimated daily sewage flow. For flows greater than one thousand five hundred (1,500) gallons per day, but less than fourteen thousand five hundred (14,500) gallons per day. The volume shall be one thousand one hundred twenty five (1,125) gallons plus seventy five percent (75%) of the daily sewage flow. For flows in excess of fourteen thousand five hundred (14,500) gallons per day, the Department and the Village shall be consulted.

4. Multiple Tanks or Compartments: When multiple compartment septic tanks or multiple septic tanks in series are used, the capacity of the first compartment or tank shall be one-half ($^1/_2$) to two-thirds ($^2/_3$) of the total required capacity. Two-compartment tanks shall also comply with the following:

   a. The wall separating the first and second compartments shall be tight-fitting and designed to handle the differential in pressure if one side is pumped.

   b. The wall separating the compartments shall extend to within 3 inches of the tank lid and shall have a free vent area equal to the cross-sectional area of the building sewer.

   c. The center of the opening between compartment shall be in line with the center of the inlet and outlet openings.

   d. The depth to the invert of the opening between compartments shall be 40% of the liquid depth.

5. Septic Tank Installation: The contractor shall use his best efforts to prevent floatation or drifting of the septic tank.

6. Abandoned Septic Tanks: Septic tanks, cesspools, and seepage pits which are no longer in use shall be completely pumped and collapsed in place, removed or filled with sand or soil.

7. Lift Station: If conditions as outlined in subsection (D)8 of this Section prohibit gravity drainage of effluent from the septic tank to the drop box, then a pump, designated by the manufacturer to handle domestic sewage, may be used as a component of a private sewage disposal system. Pump discharge head must be adequate to overcome the elevation differences between the pump and the drop boxes plus friction loss of discharge pipe. The end of the discharge line shall be designed to prevent siphoning effluent or ground water in the seepage lines back to the lift station. If check valves are required by the manufacturer, a weep hole above the valve is required to prevent freezing. Pumping rate shall not exceed the outflow capacity of the drop box.

(G) Distribution Boxes:

1. General: Distribution boxes may be installed between a septic tank or aerobic treatment plant and a subsurface seepage system or buried sand filter. If a distribution box is used, it shall be installed level on unexcavated earth, and shall provide equal distribution of flow to the subsequent disposal system.

2. Connecting Pipe: The pipe connecting the septic tank to the distribution box and the pipe connecting the distribution box to the disposal system shall be watertight.

3. Construction: Distribution boxes shall be constructed of a durable watertight, noncorrosive material. They shall be designed to accommodate the necessary distribution lines.

4. Access: Distribution boxes shall be provided with an opening which will serve as a ready access for inspection, cleaning, and general maintenance.

(H) Soil Treatment ~~Subsurface Seepage~~ System Requirements:

1. Evaluation Of Soil Characteristics: The requirements of subsection (D)9a of this section shall be followed for the evaluation of soil characteristics for a subsurface seepage system. The area of soil required for each system shall be based on the values listed in appendix G of this section as obtained from a soil investigation.

a. Procedure For Performing Soil Investigations: Soil investigations shall be conducted in the following manner:

(1) Determination of the soil characteristics on sites proposed for development with private sewage disposal systems shall be based on soil boring data collected by a soil classifier.

(2) There shall be a minimum of 3 borings per subsurface seepage system site. The soil borings shall be at least 50 feet apart, and the proposed subsurface seepage system shall be located within the area where the soil borings were located. More soil borings may be necessary for accurate and appropriate evaluation of a site where there is some concern about the consistency of the soil materials. One of the borings shall be made at the lowest elevation of the proposed absorption field area. Borings shall extend a minimum of 60 inches below the natural ground surface. An observation pit shall be used in gravelly materials.

For permit applications associated with the construction of a new home or reconstruction of a home on an existing lot, additional soil testing will be required if the procedure described above results in a determination that an at-grade system or mound system would be required. Soil borings will be required for all areas of the lot within 300' of the residence to determine if any area of the property is suitable for a soil treatment trench system. If no such area is found on the property, an at-grade system or mound system meeting the design requirements of Section 4-2-7(H)4 or 4-2-7(H)5 will be permitted.

(3) Observation and determination of soil characteristics may also be determined from a pit dug by a backhoe or other excavating equipment. The Village may require soil pits (backhoe excavation) in cases where the ground is frozen, where the soil materials are considerably varied in texture, where there has been previous or current fill material or cutting of soils, or where gravelly soils are encountered. Soil pits shall be prepared at the perimeter of the expected soil absorption area to minimize damage to natural soil structure. Soil pits shall extend a minimum of 60 inches below the natural ground surface.

(4) Site characteristics to be described include zones of seasonal and permanent water saturation, United States Department of Agriculture (USDA) soil textural changes, USDA soil structural features for each horizon, slope, compaction and depth; soil coloration; consistence; coatings; depth of limiting layer; depth of soil mottling; internal drainage classification; permeability range; and other limiting soil characteristics that may reduce permeability. The following reference materials shall be used as a guide for describing and classifying soil: Field Book for Describing and Sampling Soils, Soil Taxonomy, and Soil Survey Manual.

b. Only those meeting the definition of soil classifier as described in Section 4-2-7(C) qualified to conduct soil investigations.

2. Reserve Field: Every private sewage disposal system shall include, to the satisfaction of the building officer, a reserve soil treatment area ~~subsurface seepage field~~ for future expansion or replacement equal in size to one hundred percent (100%) of the existing ~~-~~soil treatment area ~~seepage field~~.

3. Design Requirements for Soil Treatment Trench Systems:

a. Construction: Subsurface seepage fields shall be designed and constructed in accordance with appendices H and I of this section. Any subsurface seepage field approved in clayey soils as described in exhibits D and E of title 6 of this code shall be installed in natural or undisturbed soils.

b.~~4.~~ Bedding Material: The bedding material shall be washed gravel or washed stone with a particle size ranging from three-fourths inch (3/4") minimum to one and one-half inches (1 1/2") maximum, except where a chamber system is approved. The bedding material shall extend the full width of the trench as illustrated in Appendix I of this Section. The bedding materials shall be covered by straw, newspaper, or untreated building paper or other pervious material to support the backfill as the laying of the distribution line proceeds. Tar paper, plastic, or other impervious material shall not be used between the bedding material and the earth backfill. Chamber systems may be bedded with material excavated to construct the system. The backfill material shall not contain large clods of earth, demolition material or other extraneous material. No straw, newspaper, or untreated building paper shall be placed between the chamber system and the earth backfill."

c.~~5.~~ Distribution Lines: Distribution lines shall be constructed of materials as approved in Appendix C of this Section. The lines shall be perforated or open joint tile. Where open joint tile is used, the tile sections shall be spaced not less than one-fourth inch (1/4") nor more than one- half inch (1/2") apart. Perforated piping shall have one-half to three-fourths inch (1/2" - 3/4") diameter openings on three to five inch (3" - 5 ") centers with a minimum of two (2) rows. The ends of the lines shall be looped except in serial distribution systems. Chambers systems shall include connections between adjacent chambers to prevent soil intrusion. Each row of a chamber system shall include an inlet end cap and an outlet end cap, and shall be bent no more than 20 degrees per unit unless it is capped and piped to another line.

d. ~~6.~~ Serial Distribution: The following criteria, as illustrated in Appendix J of this Section, shall be used in the design and construction of a serial distribution system:

(1) ~~a.~~ The bottom of each trench and its distribution line shall be level at a depth not greater than thirty six inches (36") from finished grade.

(2) ~~b.~~ There shall be a minimum of six inches (6") to a maximum of twenty four inches (24") of earth backfill over the bedding material in the trenches or over the top of a chamber in a chamber system. Machinery which may crush or disturb the alignment of pipe in the trench shall not be allowed on any part of the proposed area.

(3) ~~c.~~ The trench shall follow the ground surface contours so that variation in trench depth will be minimized.

(4) ~~d.~~ There shall be a minimum of six feet (6') of undisturbed earth between the septic tank and the nearest trench.

(5) ~~e.~~ Drop boxes shall be arranged in series, so that each trench is completely filled to the full depth of the gravel or to the top of the chamber in a chamber system before effluent flows to the succeeding trench.

(6) ~~f.~~ The drop boxes connecting the trenches shall have watertight joints and direct connections to the distribution lines in adjacent trenches. Drop boxes, tight joint "T's" or forty five degree (45^{o}) ells shall be used to connect adjacent trenches.

(7) ~~g.~~ Where the drop box trench connects with the higher trench, it shall not be deeper than the top of the gravel in the higher trench or the top of the higher chamber in a chamber system. Drop boxes shall rest on undisturbed earth and the backfill shall be carefully tamped.

(8) ~~h.~~ The invert of the first drop box line shall be at least six inches (6") lower than the invert of the septic tank or aerobic treatment plant outlet. (See Appendix J of this Section.)

(9) ~~i.~~ All other construction features of the serial distribution field shall comply with subsection (H)1 through 8 of this Section.

4. Design Requirements for At-Grade Systems

a. Pretreatment shall be by septic tank sized for the projected flow per Appendix F and augmented by an approved effluent filter or by a Class I aerobic unit sized per Appendix F.

b. The soil absorption area shall be plowed in accordance with Section 4-2-7(H)10.c. All vegetation shall be cut to the ground surface and removed from the soil treatment area prior to placing the sand.

c. Distribution to and into the absorption area shall be by low pressure pipe (LPP). LPP network piping shall be as specified in this section and Section 4-2-7(H)9.

d. The lift station shall be sized for the projected flow per Appendix F.

e. The invert of the distribution lines shall be a minimum of six inches (6”) above existing grade.

f. The square footage of the soil treatment area shall be equal to the projected daily flow in gallons per day divided by the wastewater loading rate in gallons per day per square foot.

g. The minimum length of the at-grade soil treatment area shall be limited by the maximum linear loading rate. The linear loading rate is equal to the projected daily flow in gallons per day divided by the total length of the soil treatment area in feet, and shall be limited as follows:

(1) At-Grade Systems on soils in resource groups A, B, or C shall be designed with a maximum linear loading rate of twelve (12) gallons per day per foot. A maximum of three (3) basal areas may be connected perpendicular to the slope.

(2) At-Grade Systems on soils in resource groups D or E shall be designed with a maximum linear loading rate of six (6) gallons per day per foot. A maximum of two (2) basal areas may be connected perpendicular to the slope.

h. When laterals are at different elevations, a flow control device shall be used to control the inline pressure of the laterals.

i. The minimum depth of gravel in the at-grade soil treatment area shall be ten inches (10"), with six inches (6") of gravel beneath the pipe and two inches (2") above. The gravel of an at-grade system shall be covered with a minimum of twelve inches (12") of topsoil to support vegetative cover. Additional cover shall be placed as needed to accommodate drainage. The gravel shall be completely covered with an appropriate geotextile fabric prior to the placement of topsoil.

5. Design Requirements for Mound Systems

a. Pretreatment shall be by septic tank sized for the projected flow per Appendix F and augmented by an approved effluent filter or by a Class I aerobic unit sized per Appendix F.

b. The basal area is defined based upon the slope of the site as illustrated in Appendix N. The basal area shall be plowed in accordance with Section 4-2-7(H)10.c and filled in accordance with Section 4-2-7(H)10.d. The fill material shall cover the entire basal area. The fill shall slope away from the top of the application bed at a maximum slope of 3:1 in all directions. All vegetation shall be cut to the ground surface and removed from the soil treatment area prior to placing the sand.

c. Distribution to and into the absorption area shall be by low pressure pipe (LPP). LPP network piping shall be as specified in this section and Section 4-2-7(H)9

d. The lift station shall be sized for the projected flow per Appendix F.

e. The invert of the distribution lines shall be a minimum of six inches (6") above the fill material.

f. The square footage of the soil treatment area shall be equal to the projected daily flow in gallons per day divided by the loading rate of the coarse sand fill, one gallon per day per square foot (1.0 gpd/ft^2) or 1.2 gpd/ft^2 when an aerobic treatment unit is proposed for pretreatment.

g. The minimum length of the at-grade soil treatment area shall be limited by the maximum linear loading rate. The linear loading rate is equal to the projected daily flow in gallons per day divided by the total length of the application bed in feet, and shall be limited as follows:

(1) Mound Systems on soils in resource groups A, B, or C shall be designed with a maximum linear loading rate of eight (8) gallons per day per foot. A maximum of three (3) basal areas may be connected perpendicular to the slope.

(2) Mound Systems on soils in resource groups D or E shall be designed with a maximum linear loading rate of four (4) gallons per day per foot. A maximum of two (2) basal areas may be connected perpendicular to the slope.

h. When laterals are at different elevations, a flow control device shall be used to control the inline pressure of the laterals.

i. The square footage of the basal area shall be equal to the projected daily flow divided by the assigned soil wastewater loading rate in gallons per day per square foot. The minimum length of the basal area shall be equal to the minimum length of the application bed.

j. The fill material shall be extended beyond the basal area, tapering to grade at 3:1 slope.

i. The minimum depth of coarse sand fill material covering the basal area shall be twelve inches (12"). The application bed shall be covered with a minimu of twelve inches of topsoil. The said fill of the end slopes and side slopes shallb e covered with a minimum of six inches (6") of topsoil. Additional cover shall be placed over the application bed(s) as needed to accommodate drainage. The gravel shall be completely covered with an appropriate geotextile fabric prior to the placement of topsoil.

6.~~7.~~ Seepage Beds: The total bottom area of the seepage bed shall be one and one-half ($1^1/_2$) times the area specified in Appendix G of this Section. Construction features shall conform to subsection (H)1 through 7 as illustrated in Appendix K of this Section. Distribution lines shall be spaced no farther than six feet (6') center to center and shall be equally spaced. Lines adjacent to the bed sidewalls shall be three feet (3') from the bed sidewall.

7~~8~~. Curtain Drain: When required by drainage conditions as identified in subsection (D) of this Section, a curtain drain system shall be installed upslope from the seepage field to intercept and accept the lateral movement of surface or ground water and discharge the water below the field in a manner that shall not cause a nuisance.

8~~9~~. Location and Design: Curtain drains shall not be within fifteen feet (15') of a seepage field line and the final ten feet (10') must be a single piece. Curtain drain trenches shall be six to twelve inches (6" - 12") wide and thirty six inches to forty eight inches (36" - 48") deep or to the top of the seasonal high water table. The trench may hold a clay or plastic piping as well as gravel having a minimum particle size of one and one-half inches ($1^1/_2$").

9. Low Pressure Pipe Systems: Distribution of wastewater into At-Grade Systems and Mound Systems by low pressure pipe systems shall be designed to the following reugirements:

a. Minimum supply/manifold line diameter shall be two inches (2").

b. Minimum lateral wastewater distribution pipe diameter shall be one and one-half inches (1½").

c. Minimum perforation size shall be three-sixteenths inches (3/16").

d. Maximum perforation spacing shall be three feet.

e. Minimum distal end pressure on any lateral line shall be one foot (1') of head pressure. Maximum distal end pressure on any lateral line shall be five foot (5') of head pressure.

10. Site Preparation: Any preprartion of the soil absorption area shall be conducted only when the soil is dry. Site preparation shall be conducted under the supervision of a licensed contractor.

a. Mowing: All sites shall be mowed and cleared of brush.

b. Tree Removal: Any removal of trees shall be by cutting near the surface. Stumps may be removed by grinding or cutting, but shall not be uprooted.

c. Plowing: Sites approved for At-Grade Systems or Mound Systems shall be plowed prior to placement of fill or gravel as follows:

(1) Equipment shall be a chiselplow or bold board plow.

(2) Plowing shall be done parallel to the site contour.

(3) Tillage shall be minimal to break the consistency of the sod; maximum depth shall be eight inches (8").

(4) After tilling, the site shall not be graded or smoothed.

d. Fill: The placement of fill material for At-Grade Systems or Mound Systems shall be as established in this section.

(1) Fill Specifications: Fill shall be gravel for At-Grade Systems and approved coarse sand for Mound Systems.

(2) Fill Placement: The fill shall be placed according to the approved plan and shall be placed immediately after site preparation.

(3) Storage and Transportation: The storage and transportation of fill shall be as specified on the approved plan; no traffic shall be allowed directly on the plowed area.

(4) Filling procedure: Fill shall be placed only from the upslope or ends of the proposed soil absorption area. Material may be placed using a backhoe reaching into the soil absorption area or may be pushed into the soil absorption area by low compression equipment maintaining a minimum of ten inches of material beneath the equipment.

(I) Buried Sand Filters:

1. General: Sand filters shall be only used in a repair situation. The effluent shall be discharged in accordance with the requirements of this Section.

2. Design Requirements:

a. Size: Buried sand filters shall be sized as follows:

(1) Residential: The sand filter surface area for residential systems shall be two hundred (200) square feet per bedroom. Where a sand filter is used in conjunction with an aerobic treatment plant, the size of the sand filter may be reduced by thirty percent (30%).

(2) Non-residential: The surface area of the sand filter shall be designed for one square foot per gallon per day for waste with an influent Biochemical Oxygen Demand (BOD) not to exceed 300 parts per million (ppm). A sand filter with flows of 801 gallons or more per day shall have the influent distributed into the sand filter by a dosing system designed according to subsection (i). The sand filter shall be dosed 4 times per day with equal flows not to exceed the design capacity of the filter.

b. Sand Filter Media: The depth of filter media shall be a minimum of twenty four inches (24"). The sand shall have an effective size of 0.5 to 2.0 millimeters, and a uniformity coefficient of less than 3.5. It shall be washed and free of clay and silt.

c. Alternate Media: Other filter media may be used in a subsurface filter provided it meets the criteria of subsection (I)2b hereof and complies with the following requirements:

(1) Is chemically and biologically inert.

(2) Will support biological growth.

(3) Has a hardness equivalent to, or greater than, that of sand.

d. Filter Media Cover: The filter media shall be covered, as illustrated in Appendix L of this Section, with a minimum of ten inches (10") of washed gravel or washed stone having a particle size ranging from three-fourths inch ($^3/_4$") minimum to one and one-half inches ($1^1/_2$") maximum. The gravel or stone shall be covered by straw, newspaper, or untreated building paper or other pervious material prior to backfilling. Tar paper, plastic, or other impervious material prior to backfilling. Tar paper, plastic, or other impervious material shall not be used between the filter media and the earth backfill. A minimum of twelve inches (12") earth cover shall be provided.

e. Distribution and Collection Lines: The distribution and collection lines shall conform to the requirements for distribution lines as given in subsection (H)7 of this Section. The distribution lines shall be level, shall be located three feet (3') from sidewalls, and shall be spaced on three foot (3') centers. They shall be solid pipe to the filter media. The collection lines shall have a slope of six inches (6") per one hundred feet (100') and one collection line shall be provided for each ten foot (10') of width or fraction thereof. The upper end of the collection line shall be capped.

f. Bedding Material: The bedding material for the collection lines shall be placed on the excavation before placement of the collection lines as shown in Appendix L of this Section and shall consist of a minimum of two inches (2") of washed gravel or washed stone having

a particle size ranging from three-fourths inches ($^3/_4$") minimum to one and one-half inches ($1^1/_2$") maximum.

g. Venting: A vent shall be placed on the downstream end of the distribution lines as shown in Appendix L of this Section. The vent shall extend above the ground surface and be screened with one-fourth inch ($^1/_4$") mesh screen or equivalent.

h. Drainage: Surface drainage shall be directed away from the filter. If conditions prohibit gravity drainage of the filter effluent, a pumping chamber shall be installed. The chamber shall be constructed of a watertight, non-corrosive material and shall be provided with a removable lid, which will serve as an access for inspection, cleaning, and general maintenance. An access port or extension collar shall extend at least 6 inches above the ground surface, and the access shall have a minimum dimension of 12 inches. The chamber shall have sufficient depth and the pump controls shall be set in a manner to allow for complete drainage of the filter to eliminate any ponding of effluent within the filter.

i. Distribution of Effluent. Buried sand filters designed to treat non-residential property with flows of 801 gallons or more per day shall have the effluent distributed into the sand filter by pumping. The pumps, pumping chamber, and ancillary equipment shall comply with the following:

(1) Dosing Volume. The dosing volume is the amount of liquid pumped or siphoned during each cycle minus the amount that drains back from the sand filter after each dose.

(2) Pump Selection. The pump shall be submersible pump designed for corrosive liquids.

(3) Siphons. Siphons can be designed where elevation exists between the sand filter and the siphon chamber. However, the siphon shall be designed to deliver the same flow rate at the same head at the distribution system as a pump system. The distribution system consisting of manifold and laterals shall be designed so that it will drain after each siphon. This shall be accomplished by placing the manifold above the laterals.

(J) Aerobic Treatment Plants:

1. General: After the effective date of this Code, aerobic treatment plants shall comply with the requirements of the National Sanitation Foundation (NSF) Standard Number 40, Individual Aerobic Wastewater Treatment, May 1983, and shall bear the NSF seal. A copy of a list of approved aerobic treatment plants may be obtained from the Building Officer.

2. Class II Effluent: Aerobic treatment systems listed by NSF for Class II effluent (BOD5-60 mg/l and suspended solids 100 mg/l) shall discharge to one of the following:

a. A subsurface seepage system designed and constructed in accordance with the requirements of subsection (H) of this Section.

b. A sand filter designed and constructed in accordance with the requirements of subsection (I) of this Section.

3. Class I Effluent: Aerobic treatment plants listed by NSF for Class I effluent (BOD5-20 mg/l and suspended solids 40 mg/l) shall discharge to a subsurface seepage field designed and constructed to be at least two-thirds ($^2/_3$) the size listed in Appendix G of this Section as obtained from soil investigation.

4. Sizing: Aerobic treatment plants which are listed by NSF as Class I and rated at five hundred (500) gallons per day may be allowed for the treatment of domestic sewage from dwellings having a maximum of three (3) bedrooms.

5. Installation: All components of aerobic treatment plants shall be installed at the time of the original installation. If there are practical difficulties, then a solid end cap shall be securely placed over the end of the discharge line until the system can be completed, to prevent a violation of subsection (D)7 of this Section.

6. Access: Access to aerobic treatment plants shall be adequate to allow maintenance and service of all components within the plant.

7. Operation Permit: Upon the installation of an approved aerobic treatment plant, the property owner shall secure an operation permit from the Building Officer at a fee to be established by the Village Board as a record and notice of the installation. The permit shall be in a form containing all pertinent information as to construction, installation and operation of the aerobic treatment plant. A copy of the permit shall be filed with the Village and the Illinois Department of Public Health and the county in which the plant is situated. This permit shall be annually renewed on the anniversary date of the installation for as long as an aerobic treatment plant is used in the private sewage disposal system for the dwelling. Failure to obtain or renew the permit shall constitute a violation of this Title.

(K) Maintenance of Private Sewage Disposal Systems

1. After January 1, 2014, as a condition of receiving a building permit to install a new private sewage disposal system or repair or renovate an existing system, the property owner shall sign the permit acknowledging that they are aware of and accept the responsibility to service and maintain the private sewage disposal system in accordance with Village requirements.

2. For systems installed and permitted after January 1, 2014, the property owner shall maintain all maintenance records on forms provided or approved by the Illinois Department of Public Health and make records available upon request of the Village. These records shall be transferred from owner to owner. Records shall be kept for the life of the system.

3. After January 1, 2014, private sewage disposal systems installed and permitted under Section 4-2-7 of the Village Code are required to be maintained and serviced to ensure proper operation in accordance with the following:

a. Septic tank to a subsurface seepage system or septic tank followed by a sand filter discharging to a subsurface seepage system.

(1) Private sewage disposal system septic tanks serving residential properties shall be evaluated prior to or within 3 years after the date of installation of the system. The system may be evaluated by the homeowner, a Private Sewage Disposal System Installation Contractor, a licensed Environmental Health Practitioner, an Illinois licensed Professional Engineer, a representative of the Illinois Department of Public Health, or an agent of the Illinois Department of Public Health. The evaluation

shall determine whether the tanks and all of the components of the private sewage disposal system have layers of scum and settled solids greater than 33% of the liquid capacity of the tank. If the layers of scum and settled solids are greater than 33%, the tanks and compartments shall be pumped out and maintenance shall be performed. After the first evaluation, the system shall be evaluated a minimum of once every 5 years. Depending on the system's use, the tanks and compartments may need to be evaluated and pumped more frequently.

(2) Private sewage disposal system septic tanks serving non-residential property shall be evaluated within 3 years after the date of installation of the system. The system may be evaluated by a Private Sewage Disposal System Installation Contractor, a licensed Environmental Health Practitioner, an Illinois licensed Professional Engineer, a representative of the Department, or an agent of the Department or local health department. The evaluation shall determine whether the tanks and all of the compartments of the private sewage disposal system have layers of scum and settled solids greater than 33% of the liquid capacity of the tank. If the layers of scum and settled solids are greater than 33%, the tanks and compartments shall be pumped out and maintenance shall be performed. After the first evaluation, the system shall be evaluated at minimum once every 3 years. Depending on the system's use, the tanks and compartments may need to be evaluated and pumped more frequently.

b. An aerobic treatment unit (ATU) requires evaluation and maintenance at least once every 6 months. The system may be evaluated by a Private Sewage Disposal System Installation Contractor, a licensed Environmental Health Practitioner; an Illinois licensed Professional Engineer, a representative of the Illinois Department of Public Health, or an agent of the Illinois Department of Public Health. The homeowner of an ATU may conduct the inspection and maintenance as defined within the Act, but the inspection and maintenance shall be performed per the manufacturer's requirements to assure proper operation. If the required inspections and maintenance are not performed, the system is in violation of the Act and this Part.

c. Buried sand filters require an evaluation to determine whether the tanks and all of the compartments of the private sewage disposal system have layers of scum and settled solids greater than 33% of the liquid capacity of the tank. If the layers of scum and settled solids are greater than 33%, the tanks and compartments shall be pumped out and maintenance shall be performed. The system shall be evaluated a minimum of once every year. The system may be evaluated by a Private Sewage Disposal System Installation Contractor, a licensed Environmental Health Practitioner, an Illinois licensed Professional Engineer, a representative of the Illinois Department of Public Health, or an agent of the Illinois Department of Public Health. Depending on the system's use, the tanks and compartments may need to be evaluated and pumped more frequently.

4. A failure to properly operate, maintain, and have routine service conducted on a private sewage disposal system is a violation of this Title of the Village Code.

(L) Swimming Pool Wastewater:

1. General: Wastewater generated from the operation of a swimming pool includes clear wastes, such as drainage from the pool proper, deck drainage, and perimeter overflow system drainage; and turbid wastes, such as filter wash and backwash water.

2. Approved Treatment and Disposal: Wastewater from swimming pools may not be discharged to a private sewage disposal system receiving domestic sewage. It shall be disposed of in the following manner:

a. Clear water wastes may be discharged directly to storm sewers, surface drainage ways or to the ground surface without additional treatment. Such drainage shall not result in nuisance conditions including, but not limited to, offensive odor, stagnant wet area or a breeding environment for insects.

b. Wash or backwash water from an approved treatment system of swimming pool wastewater may be discharged to natural drainage areas, storm sewers, seepage pits, or to the ground surface. Diatomaceous earth filter wash or backwash water may be discharged to one of the above after treatment consisting of one of the following approved systems:

(1) Passing the wastewater through a separation tank designed for removal of the diatomaceous earth and suspended solids.

(2) Settling the wastewater in a tank which is capable of holding the volume of one backwash. One backwash is defined as the amount of water generated from the backwash of the filters for a period of two (2) minutes for diatomaceous earth filters, at the required backwash flow rate. The tank shall be de-watered after settling and prior to subsequent backwashes. Settled sludge shall be periodically removed to prevent flushing of solids during backwashing. (See Appendix M of this Section.)

(3) A separate private sewage disposal system designed and constructed in accordance with the applicable provisions of this Section.

(M) Servicing, Cleaning, Transporting and Disposing of Wastes from Private Sewage Disposal Systems:

1. General: The collection, storage, transportation, and disposal of all septage shall be handled in accordance with this subsection (L).

2. Truck Identification: The name under which the business is conducted and the address of each contractor shall be painted on each side of every pumper truck operated by him. The letters shall be easily legible and at least three inches (3") high.

3. Equipment Inspection: Equipment shall be subject to inspection and approval by a representative of the Department of the Village at any reasonable time; and upon request, shall be available for inspection at a designated location.

4. Vehicle Construction and Equipment: Each vehicle used for collection and transportation of waste shall be equipped with a leakproof and tightly sealed tank for septage hauling. The interior and exterior sections of all portable containers, pumps, hoses, tools, or other implements which have been contaminated shall be rinsed clean after each use and the rinsings shall be disposed of such that no health hazard or nuisance results. Trucks and tanks shall comply with the following:

a. The vehicle shall be equipped with either a vacuum pump or other type of pump which is self-priming and will not allow any seepage from the diaphragm or other packing glands.

b. The discharge nozzle will be located so that there is no flow or drip onto any portion of the

truck.

c. The discharge nozzle shall be capped when not in use.

5. Seepage Disposal Site: Each licensed contractor engaged in septage disposal shall file with the Department, and each year amend, a statement describing the location and methods of disposal of septage. Methods of septage disposal approved by the Department are as follows:

a. Discharge to a Municipal Sanitary Sewer System: Discharge to a Municipal sanitary sewer system is approved when the Municipality has approval from the Illinois Environmental Protection Agency to receive septage from private sewage disposal systems; and the contractor has written approval from the Municipality to discharge septage into the system.

b. Application to Agricultural Land: Septage may be applied to agricultural land provided the following criteria are met:

(1) The depth to the ground water table or to fractured limestone formations is at least four feet (4') below the ground surface.

(2) The septage is disposed of in the following manner:

(a) It originates from private sewage disposal systems which treat only domestic sewage;

(b) It is not applied to land which has been saturated by rainfall during the twenty four hour (24) period preceding the intended application time;

(c) It is not applied to land with water ponded upon it;

(d) It is not applied to land within one hundred fifty feet (150') of wells, homes, or other water supplies, ponds, or streams;

(e) It is not applied to land having greater than five percent (5%) slope;

(f) It is not applied to land that is intended to grow root vegetables, or other low growing fruits and vegetables which may be eaten raw;

(g) It is applied at a rate which does not exceed five thousand (5,000) gallons of septage per acre per month;

(h) Where it is determined by the Department or the Village that a nuisance condition exists, then the septage shall be incorporated into the soil.

(3) Discharge to Sludge Lagoons or Sludge Drying Beds: Discharge to a sludge lagoon or drying bed must be approved by the Illinois Environmental Protection Agency, or the owner/operator of the lagoon or drying bed must have a permit from the Illinois Environmental Protection Agency to receive septage from the contractor. If the contractor is going to construct a sludge lagoon or drying bed, a permit will be necessary from the Illinois Environmental Protection Agency to construct and operate the proposed facility.

(4) Discharge to an Incinerator Device: Discharge of septage to an incinerator must be approved by the Illinois Environmental Protection Agency or the owner/operator of the incinerator must have a permit from the Illinois Environmental Protection Agency to receive septage from the contractor.

(5) Discharge to a Sanitary Landfill: Discharge to a sanitary landfill must be approved by the Illinois Environmental Protection Agency or the owner/operator of the landfill must have a permit from the Illinois Environmental Protection Agency to receive the septage from the contractor.

6. Other Wastes: Automotive grease, oil, grit, or toxic wastes, or any waste other than septage shall not be applied to agricultural land.

(N) Minimum Performance Standards for Private Sewage Disposal Contractors:

1. General: All private sewage disposal contractors working within the corporate limits of the Village shall be licensed by the Illinois Department of Public Health pursuant to 225 Illinois Compiled Statutes 225/4. All notification forms, plans and percolation test results, and copies thereof, shall bear the seal of a registered professional engineer. The affixing of a registered professional engineer's seal to any work which has not been done by, or under the professional supervision, of the registered professional engineer is a violation of the Illinois Professional Engineering Act and the Village shall cause the Act to be enforced.

a. Installers of Private Sewage Disposal Systems: Licensed contractors who install or repair private sewage disposal systems within the corporate limits of the Village shall:

(1) Obtain a permit from the Building Officer prior to the commencement of a new system or repair. The application for the permit shall be in writing on forms provided for this purpose and shall include at a minimum: name of the property owner, legal description of the property, existing and proposed contours, location of any lakes, streams, surface and subsurface drainage ways within one hundred feet (100') of the system, water table elevation, location of any well and potable water lines, locations and results of percolation tests, design calculations and location and dimension of the system (including reserve seepage field).

(2) Construct or repair the private sewage disposal system in accordance with this Section.

(3) Comply with the inspection requirements in subsection 4-2-8(C) of the Village Code.

b. Pumpers and Tank Cleaners: Contractors who pump, service and clean septic tanks and dispose of their contents shall:

(1) Notify the Department or the Village of the site utilized for disposal, and of any changes in the site of disposal.

(2) Comply with all requirements of subsection (L) of this Section of the Village Code.

(3) Provide an annual estimate of the total gallons of septage disposed of at each site. This estimate shall be given at the time application is made for license renewal.

2. Non-Performance of Private Sewage Disposal Services: Licensed private sewage disposal contractors who have not installed, modified, or renovated any systems or have not serviced or cleaned any private sewage disposal systems during the preceding year, shall so indicate on the renewal application to the Department at the time application is made for license renewal.

3. Enforcement: Failure to comply with the minimum performance standards of this Section, shall constitute sufficient grounds for suspension, revocation or refusal to renew a license. The Department's "Rules and Regulations of Practice and Procedure in Administrative Hearings (77 Illinois Administrative Code 100)" will govern such actions.

(O) Appendices: The appendices attached hereto are incorporated herein.

(P) Prerequisite to Building Permit: The Building Officer shall be provided with adequate proof of compliance with this Section prior to the issuance of a building permit. (Ord. 84-4, 3-26-84)

(Q) Enforcement: The Board of Health shall administer and enforce this Section to the extent not preempted by the Illinois Department of Public Health. (Ord. 92-8, 4-27-92)

APPENDIX A

Table A.1 – Soil Resource Groups

Soil Resource Group A: The following soils formed in loamy to sandy material overlying sandy or gravelly lacial outwash, have a moderately well or greater drainage class, and a particle size class of coarse-loamy, sandy skeletal, or fine-loamy over sandy or sandy-skeletal.

54 Plainfield
93 Rodman
323 Casco
325 Dresden
327 Fox
570 Martinsville
706 Boyer

Soil Resource Group B: The following soils formed in silty material overlying stratified glacial outwash, have a somewhat poor or greater drainage class, and a particle size class of fine-silty.

134 Camden
365 Aptaksic
442 Mundelein
443 Barrington
526 Grundelein
696 Zurich
697 Wauconda
698 Grays
791 Rush
792 Bowes

Soil Resource Group C: The following soils formed in silty clay loam glacial till, have a somewhat poor or greater drainage class, and a particle class size of fine.

23 Blount
146 Elliott
194 Morley
223 Varna
298 Beecher
530 Ozaukee
531 Markham

Soil Resource Group D: The following soils formed in silty clay loam lacustrine sediments and have a somewhat poor or greater drainage class.

189 Martinton
192 Del Rey
370 Saylesville

Soil Resource Group E: The following soils formed in silty clay or clay glacial till and have a somewhat poor or greater drainage class.

228 Nappanee
320 Frankfort

Soil Resource Group F: The following soils have a seasonal high water table at a depth of less than 12 inches from the ground surface.

67 Harpster
97 Houghton Peat
103, 1103, 3107 Houghton Muck
107, 1107 Sawmill
153 Pella
219 Millbrook
232 Ashkum
330, 1330 Peotone
367 Beach Sand
465 Montgomery
488 Hooppole
513 Granby
523 Dunham
626 Kish
1082 Millington
1529 Selmass
GP Gravel Pit
MA Marsh
ML Made Land

Table A.2 – Maximum Wastewater Loading Rates: Trench Systems & seepage beds use the most limiting soil condition in the upper 24"; At-grade systems and mound systems use the most limiting soil condition in the upper 12".

	Till / Lacustrine	Outwash
Gravelly coarse sand	0.00	0.00
Moderate or strong platy structure	0.00	0.00
Sandy clay loam, silty clay loam, or finer, and weak platy structure	0.00	0.00
Moist soil consistence stronger than firm or any cemented class	0.00	0.00
Sandy clay, clay, or silty clay texture and weak or massive structure	0.00	0.00
Sandy clay loam, clay loam, silty clay loam, silt, loam or silt loam texture and massive structure	0.00	0.00
Sandy clay, clay, or silty clay texture of low clay content and moderate or strong structure	0.20	0.20
Sandy clay loam, clay loam, silty clay loam or silt loam texture with weak structure	0.20	0.30
Clay loam, silty clay loam, or silt loam texture and moderate or strong structure	0.40	0.50
Sandy loam or loam texture and weak structure	0.40	0.50
Sandy clay loam, sandy loam, or loam texture and moderate or strong structure	0.50	0.70
Fine sand, very fine sand, loamy fine sand, or loamy very fine sand	0.60	0.70
Loamy sand, sand, or coarse sand texture	0.80	0.80

When a Class I aerobic unit is proposed, the wastewater laoding rate indicated above may be increased by a factor of 20%.

APPENDIX B

Table B.1 - QUANTITY OF SEWAGE FLOWS

Type Of Establishment	Gallons Per Person Per Day (Unless Otherwise Noted)
Permanent Dwellings	
Board houses	50
Boarding schools	150
Institutions, other than hospitals (per bed)	125
Mobile homes, individual (per bedroom)	200
Mobile home parks (per space)	400
Multi-family dwellings (per bedroom)	150
Rooming houses	40
Single family dwellings (per bedroom)	200*
Travel And Recreational Facilities	
Airports, railway stations, bus stations	5
Campgrounds	
Comfort station w/toilets and showers (per space)	35
Comfort station w/toilets, no showers (per space)	25
Day camps, no meals	25
Travel trailer parks with water and sewer hook-ups (per space)	50
Cottages and/or small dwellings with seasonal company (per bedroom)	150
County clubs (per member)	25
Highway rest areas	5
Hotels and motels (per bed)	50
Picnic parks	5
*See Appendices F and G	
Places for public assembly	5
Swimming pools and bathing beaches	10

Theaters	
Movie (per seat)	5
Drive-in (per car space)	10
Commercial, Industrial, And Miscellaneous	
Churches (per seat)	3
With kitchens, add (per meal)	3
Construction camps or sites, factories	
With toilets and showers	35
With toilets, no showers	20
Hospitals (per bed)	250
Laundries (per customer)	50
Offices and other day workers	15
Restaurants, with toilets (per meal)	10
Restaurants, without toilets (per meal)	3
Additional for bars and cocktail lounges	2
Schools	
Without cafeterias or showers	15
With cafeterias and showers	25
With cafeterias or showers	20
Service stations (per vehicle served)	10
Shopping centers (per 1000 sq. ft. floor area)	250
Stores (per toilet room)	400

~~APPENDIX B~~

Table B.2 - APPROVED PLASTIC PIPE MATERIALS

MATERIAL	SYMBOL	STANDARD
Acrylonitrile_Butadiene_Styrene	ABS	ASTM DI788_78a
Polyethylene (corrugated and perforated)	PE	ASTM F405_77a
Polyethylene (smooth-wall and perforated)	PE	ASTM D3350_80
Polyvinylchloride	PVC	ASTM DI784_78
Polyvinylchloride (Schedule 40, 80 & 120)	PVC	ASTM DI784_78 DI785_76
Styrene-Rubber	SR	ASTM D2852_77
Styrene-Rubber (perforated)	SR	ASTM D3298_74

APPENDIX C

LIST OF APPROVED PLASTIC PIPE FOR SEPTIC USES

TYPES OF PIPES	ASTM STANDARD	BUILDING SEWER[1] 5 Ft. From Building To Septic/Aeration Tank To 6 Ft. Beyond Tank Or Distribution box	SEWER LINES[1] Additional Treatment Facilities, And Sand Filter Collection And Distribution Lines	ALL DISTRIBU-TTION LINES
ABS (sewer pipe)	D2751-05	x[2]	x[2]	x[2]
ABS (DWV schedule 40)	D2661-06; F628-06	x	x	x
PVC (type PSM)	D3034-06	x[2]	x[2]	x[2]
PVC (DMV schedule 40)	D2665-07; F891-04	x	x	x
PVC (STD/-perforated)	D2729-03		x	x
PE (corrugated or perforated)	F405-05[3]			x

x -INDICATES APPROVED USE

1 -Commingling of plastic materials shall not be done except through use of proper adaptors (see Illinois State Plumbing Code, 1983). When building sewer is of a type of material that is different from building drain, proper transition fittings shall be used.

2 -Pipe shall not have a standard dimension ratio (SDR) greater than 35.

3 -Heavy duty only.

APPENDIX D

LOCATION OF COMPONENTS OF PRIVATE DISPOSAL SYSTEMS [1]

MINIMUM DISTANCE ALLOWABLE FROM[1]

COMPONENT PART OF SYSTEM	Well or Suction Line from Pump to Well	Water Supply Line[3] (Pressure)	Lake, Stream or Other Body of Water[4]	Dwelling	Property Line or R.O.W.[5]	Field Drain Tile
	FEET	FEET	FEET	FEET	FEET	FEET
Building Sewer[2]	50	10	50	-	-	-
Septic Tank/Aerobic Treatment Plant	50	10	50	10	10	-
Distribution Box	75	10	50	10	10	
Soil Absorption Trench / Bed ~~Subsurface Seepage System~~ (Except Chamber Systems)	75	25	50	20	10	10
Sand Filter	75	25	50	20	10	10
Chamber System	100	25	100	20	10	25
Class V Injection Wells[6]	200[7]	25	25	10	5	10

1. These distances have been determined for use in clay, silt, and loam soils only. The minimum distances required for the use of a private sewage disposal in sand or other types of soil shall be determined and approved by the Village when the soil in question can provide equal or greater treatment of the sewage. See 4-2-7(D) for additional requirements.

2. The building sewer may be located to within 10 feet of a well or suction line from the pump to the well when cast iron pipe with mechanical joints or Schedule 40 PVC pipe with water-tight joints is used for the building sewer.

3. See 4-2-7(D)4 for details on the separation of sewer and water lines.

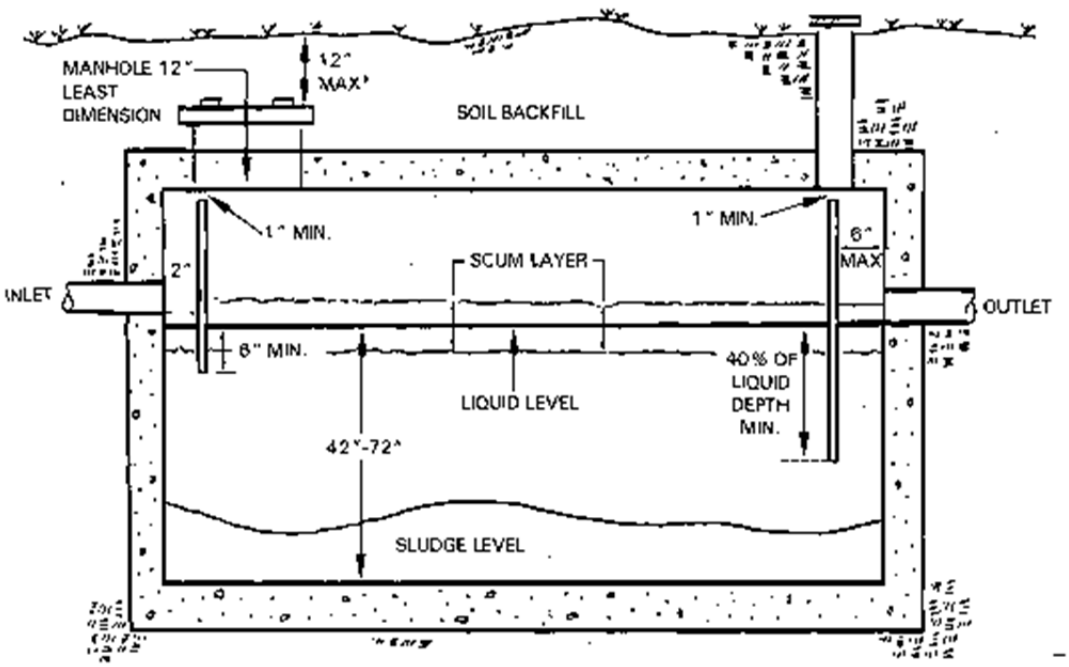
4. The minimum distance allowable from an inground swimming pool is 25 feet. See 4-2-7(K) for additional requirements.

5. Whichever line is most restrictive.

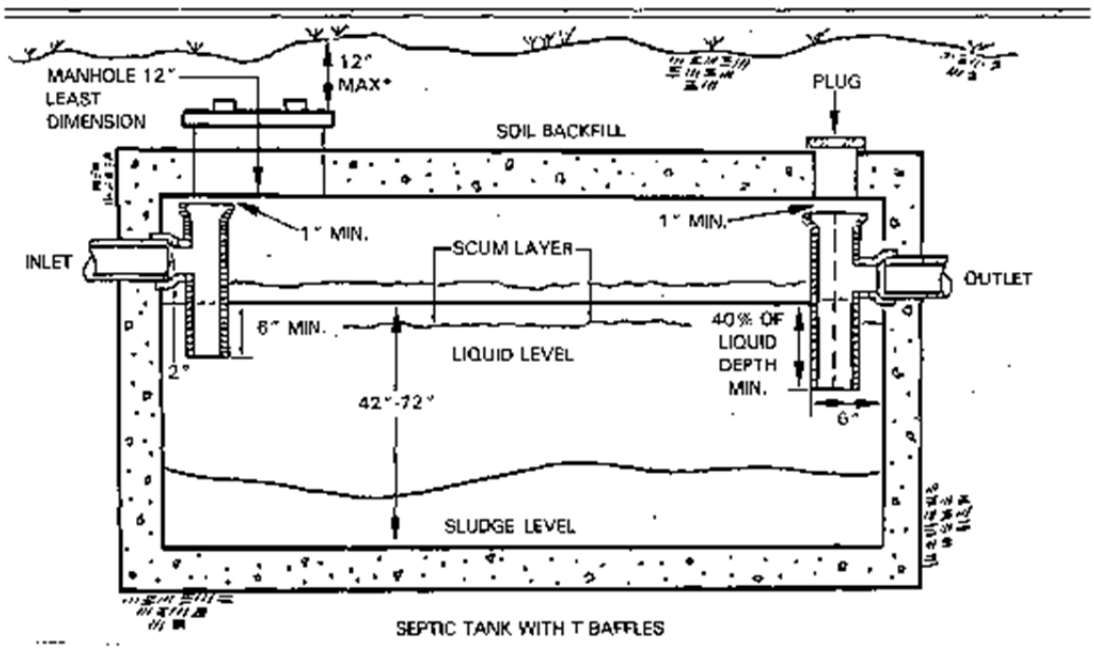
6. Class V Injection Wells are defined in Illinois Pollution Control Board rules. They are typically a shallow well used to place fluids directly below the land surface. See, e.g. 35 Ill. Adm. Code 704.105, 704.106, and 704.280.

7. A lesser separation distance may be obtained with approval or a waiver from the IEPA.

APPENDIX E*



SEPTIC TANK WITH SLIP IN BAFFLES



SEPTIC TANK WITH T BAFFLES

*See 4-2-7(F)2

APPENDIX F*

TABLE F.1 - MINIMUM VOLUMES FOR SEPTIC TANKS & AEROBIC TREATMENT UNITS SERVING RESIDENTIAL UNITS

Number Of Bedrooms	Septic Tank- Minimum Liquid Capacity Of Tank In Gallons	Aerobic Units (Gallons per day)
2 or less	1,250	400
3	1,500	500
4	2,000	600
5	2,500	750
6	3,000	900
7 or more	3,500	1050

TABLE F.2 - MINIMUM VOLUMES FOR SEPTIC TANKS & AEROBIC TREATMENT UNITS SERVING NON-RESIDENTIAL UNITS

Sewage Flow In Gallons Per Day	Septic Tank- Minimum Liquid Capacity Of Tanks In Gallons	Aerobic Units (Gallons per day)
Less than 500	750	1.0 x design flow
500 to less than 1,500	1.5 (gallons per day)	1.0 x design flow
1,500 to less than 14,500	1,125 + .75 (gallons per day)	1.0 x design flow
*See 4-2-7(F)3		

(Ord. 84-4, 3-26-1984)

TABLE F.3 - LIFT STATION SIZING STANDARDS

NUMBER OF BEDROOMS	MINIMUM LIQUID CAPACITY (GALLONS)
2 or fewer	750
3-4	1000
5 or more	1500

APPENDIX G
SUBSURFACE SEEPAGE SYSTEM SIZE DETERMINATION

EXHIBIT A- Loading Rates in Square Feet Per Bedroom and Gallons/Square Feet/Day

Design Group	Soil Group (Most Limiting Layer)	Minimum Separation to Limiting Layer	Permeability Range	Size of System	
				Residential Reg. Absorption (ft^2/bedroom)	Institutional/Commercial Allowable Rate (GPD/ft^2)
I	1A	NR[2]	Very Rapid	NR[2]	NR[2]
II	2A; 2B; 2K	3 feet	Rapid	200	1.0
III	3B; 3K	3 feet	High Moderately Rapid	220	0.91
IV	3A; 3L; 4D; 4K	3 feet	Low Moderately Rapid	240	0.84
V	4A; 4B; 4H; 4L; 5D	3 feet	Very High Moderate	265	0.75
VI	4F; 4M; 5B	3 feet	High Moderate	290	0.69
VII	4N; 5A; 5C; 5H; 5K; 6D	2 feet	Moderate	325	0.62
VIII	4O; 5E; 5I; 5L; 6A; 6B; 6E; 6H; 6K	2 feet	Low Moderate	385	0.52
IX	5F; 5M; 6C; 6L; 7D; 7F	2 feet	High Moderately Slow	445	0.45
X	5G; 6F; 6I; 7E; 7C; 7H	2 feet	Low Moderately Slow	500	0.40
XI	5N; 6G; 6J; 6M; 7F; 7I	2 feet	Slow	740	0.27
XII	7G; 7J; 7L; 8E; 8I	2 feet	Very Slow	1000	0.20
XII	5O; 6N; 6O; 7M;7N; 7O; 8J; 8M; 8O	NR[2]	NR[2]	NR[3]	0.00
XIII	9	**SUBSURFACE DISPOSAL NOT RECOMMENDED**			

[1] Limiting layers include fragipans; bedrock; compact glacial tills; seasonal high water table or other soil profile features that will materially affect the absorption of liquid from the disposal field.

[2] NR = Subsurface disposal system not recommended.

Exhibit B- Key for Determining Sewage Loading Rates (Gallons/Square Foot/Day)

Structure and Parent Material	Single grain: Weak; Platy[2]	Granulary, Angular, and Subangular Blocky; Prismatic									Structureless or Massive				
		Loess; Outwash; Alluvium; Lacustrine						Till							
		Weak		Moderate; Strong		Strong		Moderate; Strong			Loess; Outwash; Alluvium; Lacustrine			Till[3]	
1. Fragmental; Ext. or Very Gravelly Sand	>1.00[4]	N/A[5]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2. Sand; Loamy coarse sand; Loamy sand; Gravelly sand; Gravelly loamy sand	1.00	1.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.00	N/A	N/A	N/A	N/A
3. Fine sand; Loamy fine sand; Coarse sandy loam	0.84	0.91	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.91	0.84	N/A	N/A	N/A
4. Sandy loam; Fine sandy loam; Gravelly sandy loam; Gravelly loam; Gravelly silt loam	0.75	0.75	N/A	0.84	N/A	0.69	N/A	N/A	0.75	N/A	0.84	0.75	0.69	0.62	0.52
5. Loam; Silt loam; Very fine sandy loam; Sandy clay loam; Silt; Very fine sand; Loamy very fine sand; Gravelly clay loam	0.62	0.69	0.62	0.75	0.52	0.45[6]	0.40[6]	0.62	0.52	N/A	0.62	0.52	0.45[6]	0.27[6]	N/R[7]
6. Silty clay loam (<35% c); Clay loam (<35% c)	0.52	0.52	0.45[6]	0.62	0.52	0.40	0.27	0.52	0.40[6]	0.27[6]	0.52	0.45[6]	0.27[6]	N/R	N/R
7.Silty clay loam (>35% c); Clay loam (>35% c)	N/A	N/A	0.40[6]	0.45[6]	0.40[6]	0.27[6]	0.20[6]	0.40[6]	0.27[6]	0.20[6]	N/A	0.20[6]	N/R	N/R	N/R
8. Sandy clay; Clay	N/A	N/A	N/A	N/A	0.20[6,9]	N/A	N/A	N/A	0.20[6,9]	N/R	N/A	N/A	N/R	N/A	N/R
9. Organics; Fragic; Lithic; Paralithic	---SOIL PROPERTIES HAVE VERY SEVERE LIMITATIONS; SUBSURFACE DISPOSAL NOT RECOMMENDED-----														

FOOTNOTES:

[1] Disturbed soils are highly variable and require special on-site investigations.

[2] Moderate or strong platy structures for the soil textures in Groups 4, 5, and 6 have a loading rate of 0.40 g/sq.ft/d. Platy structure having firm or very firm consistency or caused by mechanical compaction has a loading rate of 0.0 g/sq.ft/d.

[3] Basal glacial tills structured by geogenic processes have the same loading rates as structureless glacial till.

[4] This soil group is estimated to have very rapid permeability and exceeds the maximum established rate in Appendix G, Exhibit A.

[5] N/A means not applicable.

[6] These soil groups are estimated to have moderately slow to very slow permeability and are less than the minimum established rate in Appendix G, Exhibit A.

[7] N/R means not recommended. These soils have loading rates considered too low for conventional subsurface disposal.

[8] In some areas, lacustrine material may have physical properties similar to glacial till and should be placed in the glacial till columns.

[9] Non swelling (1:1 lattice) clays formed in bedrock residuum have a loading rate of 0.27 g/sq.ft/d. Swelling (2:1 lattice) clays are not recommended for subsurface disposal.

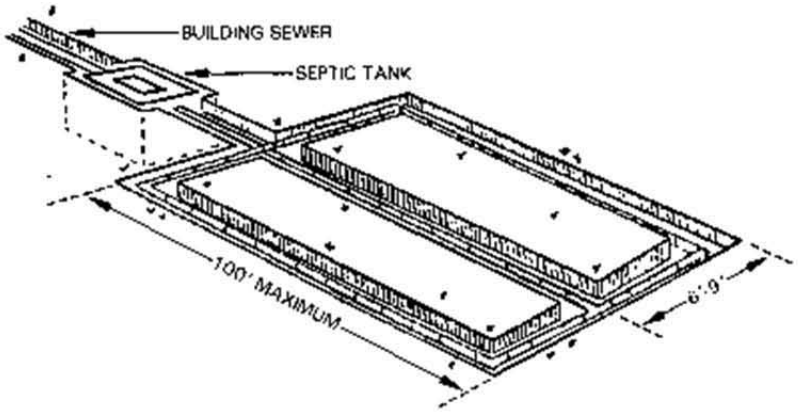
APPENDIX H

STANDARDS FOR SEEPAGE FIELD CONSTRUCTION	
Trench bottom, minimum width……8 in.	
Trench bottom, maximum width……..36 in.	
Trench bottom, minimum depth…….18 in.	
Trench bottom, maximum depth……...36 in.	
Trench bottom, slope……..level	
Distribution line, minimum diameter……..4 in.	
Distribution line, minimum earth cover……..6 in.	
Distribution line, maximum earth cover……24 in.	
Distribution line, maximum slope……..level	
Distribution line, maximum length……100 ft.	

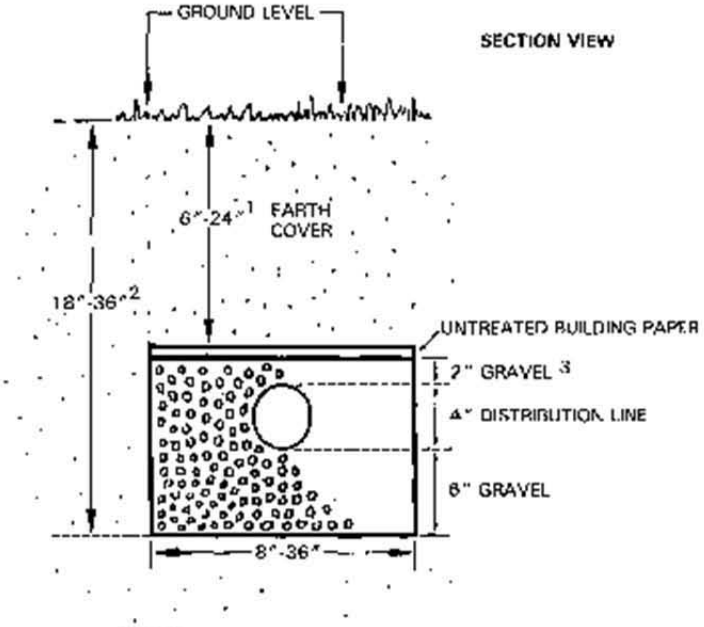
SIZE AND SPACING FOR SEEPAGE FIELD CONSTRUCTION		
Width Of Trench At Bottom	Minimum Center To Center Spacing Of Distribution Lines	Effective Absorption Area Per Linear Foot Of Trench
Inches	Feet	Square Feet
8	6.0	0.67
12	6.0	1.0
18	6.0	1.5
24	6.0	2.0
30	7.5	2.5
36	9.0	3.0

APPENDIX I

SEPTIC TANK AND SUBSURFACE SEEPAGE FIELD



PLAN VIEW

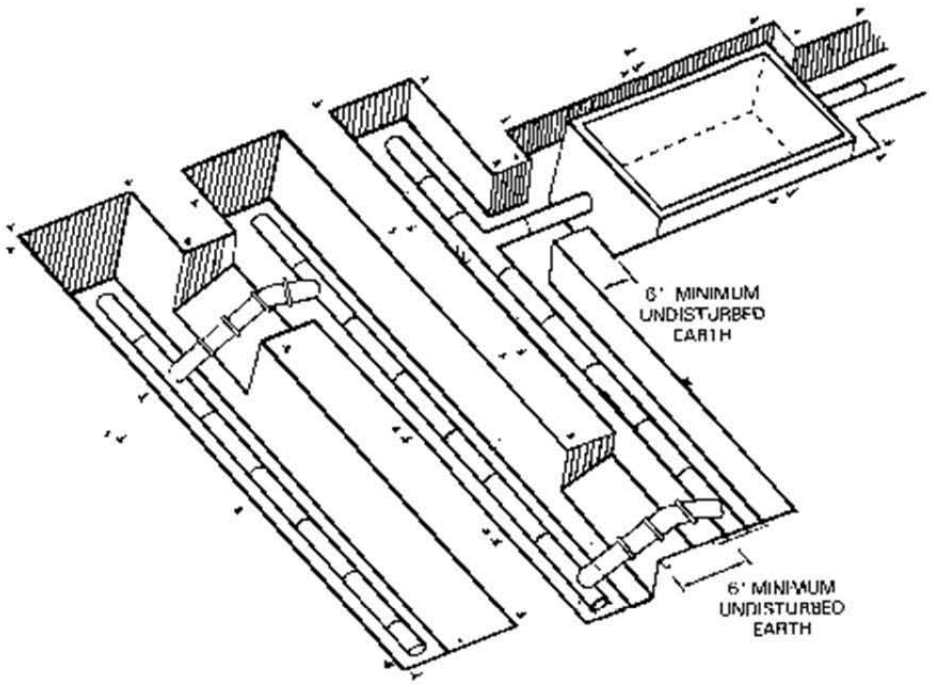


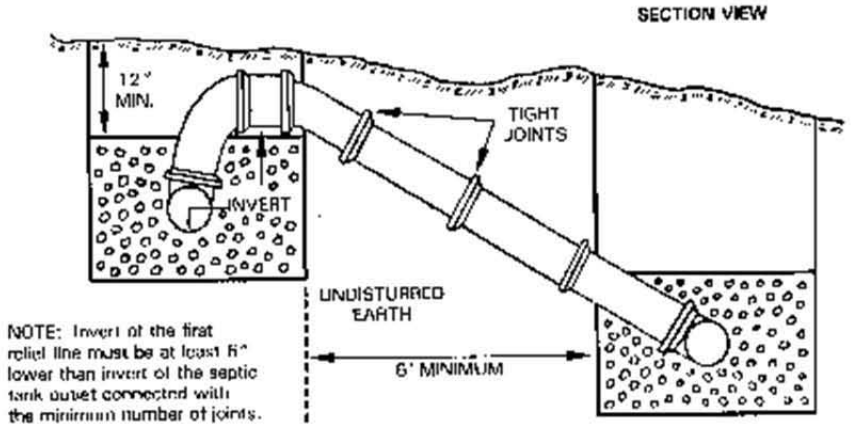
NOTES:

1. 12" 24" IS RECOMMENDED
2. 24" IS RECOMMENDED
3. 5" OR MORE IS RECOMMENDED

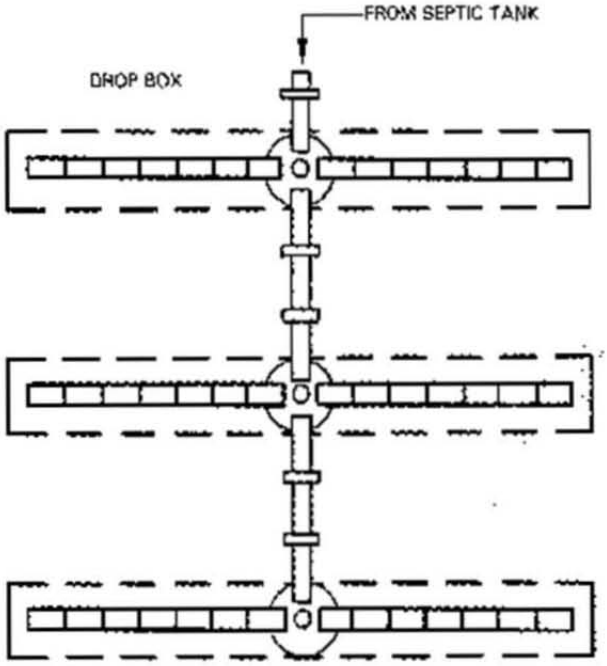
589

APPENDIX J
SERIAL DISTRIBUTION

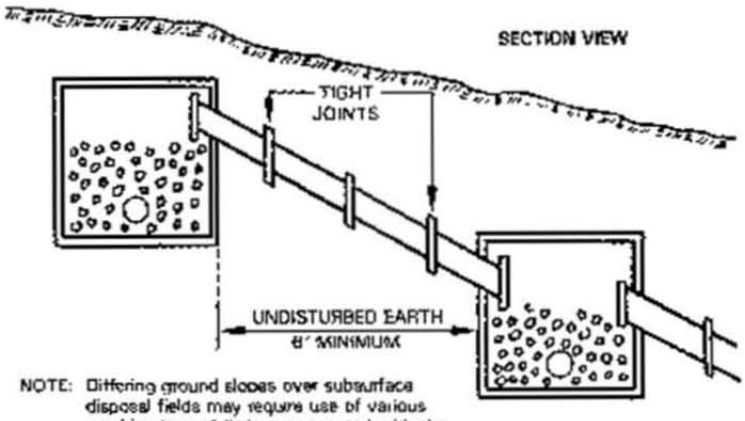




APPENDIX J (cont.)
SERIAL DISTRIBUTION

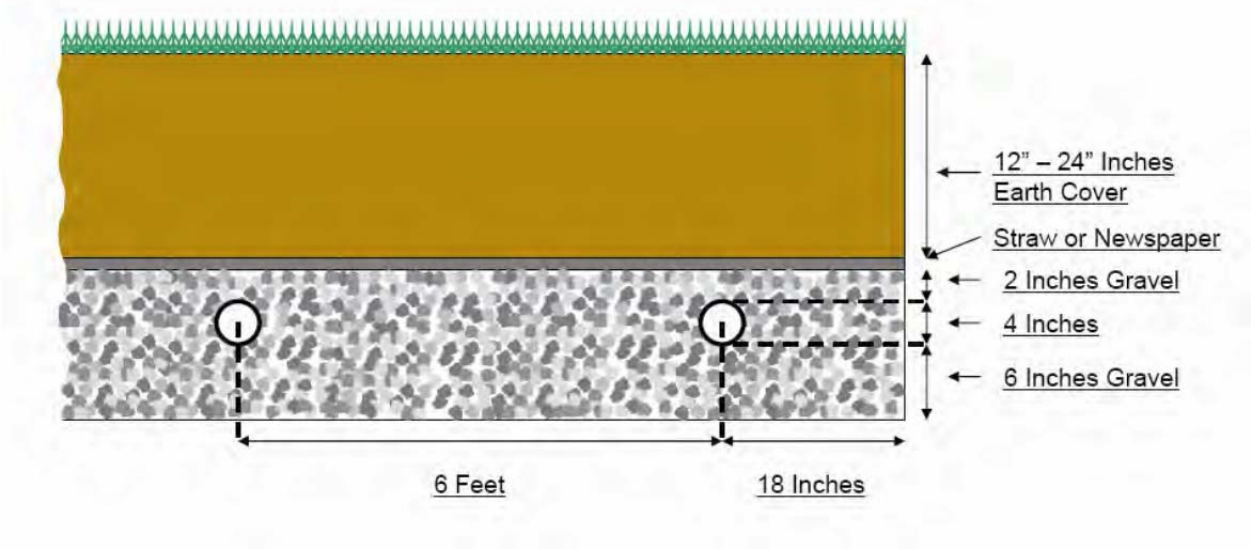


PLAN VIEW

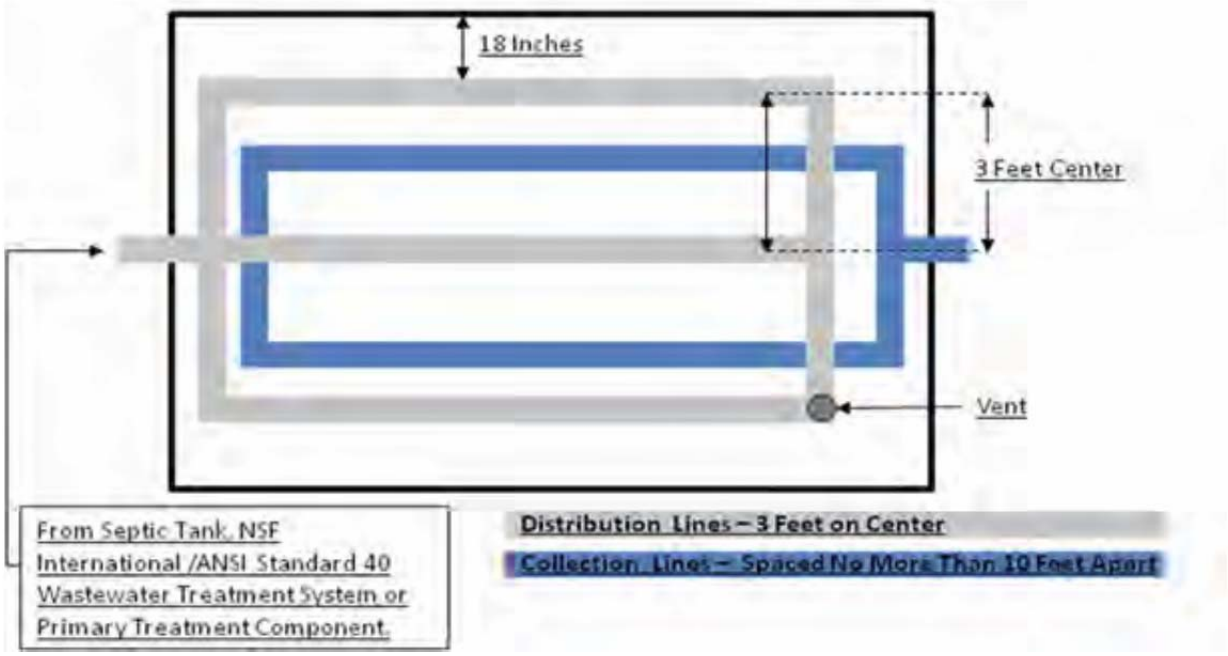


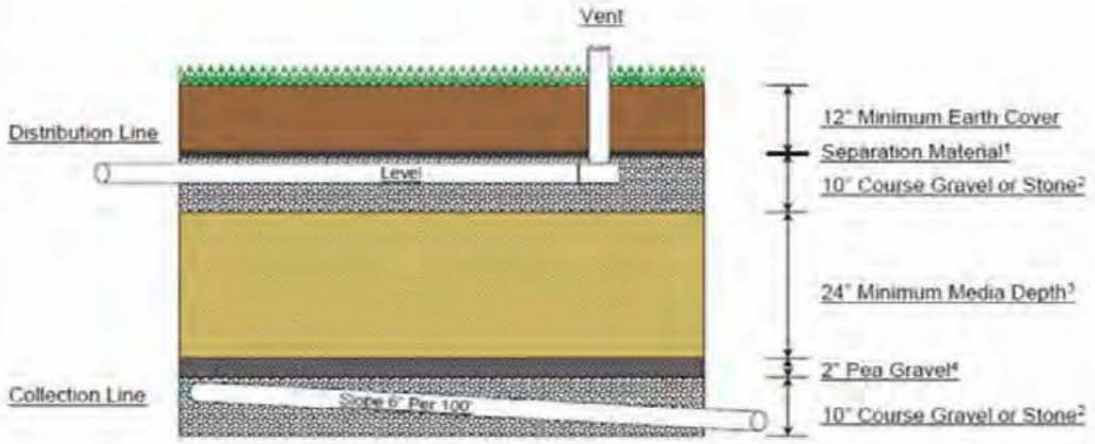
NOTE: Differing ground slopes over subsurface disposal fields may require use of various combinations of fittings connected with the minimum number of joints.

APPENDIX K
SEEPAGE BED

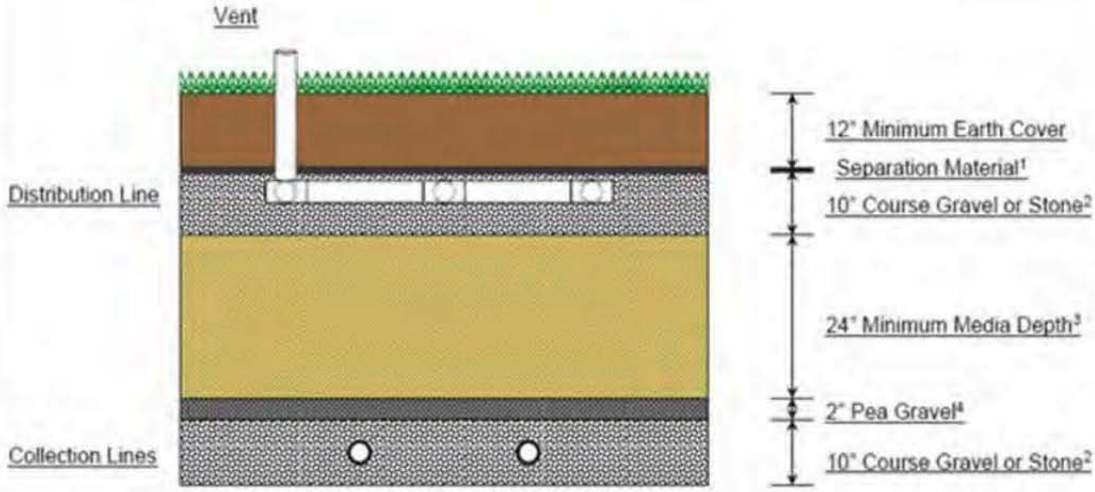


APPENDIX L
BURIED SAND FILTER





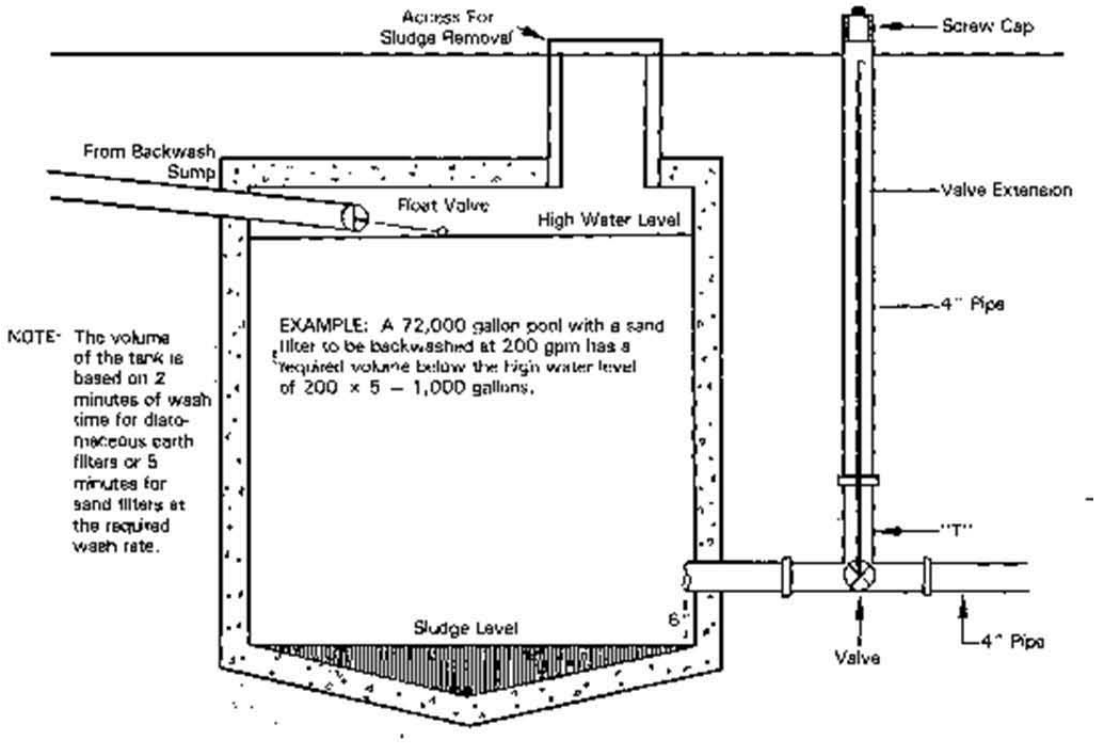
[1] Separation materials to support the backfill: straw, newspaper, untreated building paper, geotextile fabric or other permeable or biodegradable material.
[2] Course Gravel or Stone: 3/4" to 2 1/2" diameter.
[3] Sand Filter Media: The sand shall have an effective size of 0.5 to 2.0 millimeters and a uniformity coefficient of less then 3.5.
[4] Pea Gravel: 1/8" to 3/8"diamter.



[1] Separation materials to support the backfill: straw, newspaper, untreated building paper, geotextile fabric or other permeable or biodegradable material.
[2] Course Gravel or Stone: 3/4" to 2 1/2" diameter.
[3] Sand Filter Media: The sand shall have an effective size of 0.5 to 2.0 millimeters and a uniformity coefficient of less then 3.5.
[4] Pea Gravel: 1/8" to 3/8"diamter.

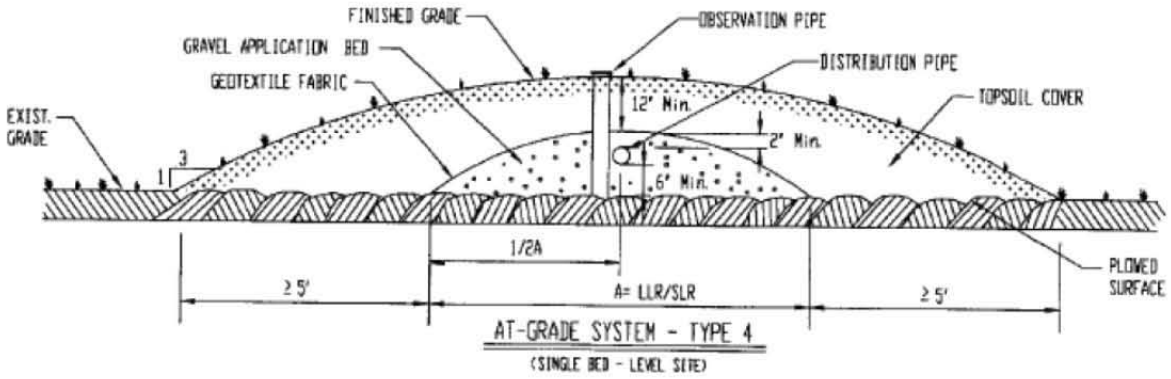
APPENDIX M

SWIMMING POOL BACKWASH WATER HOLDING TANK

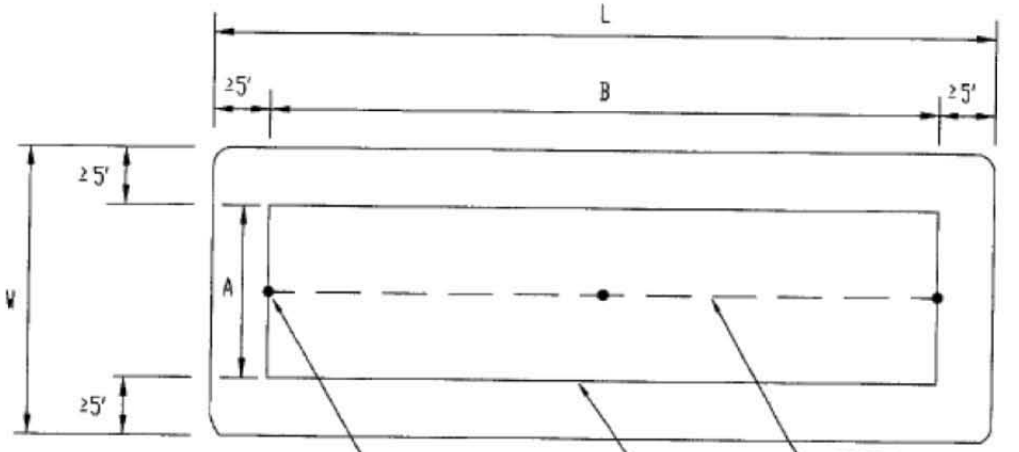


APPENDIX N

Figure N.1 At-Grade System: Single Bed, Level Site



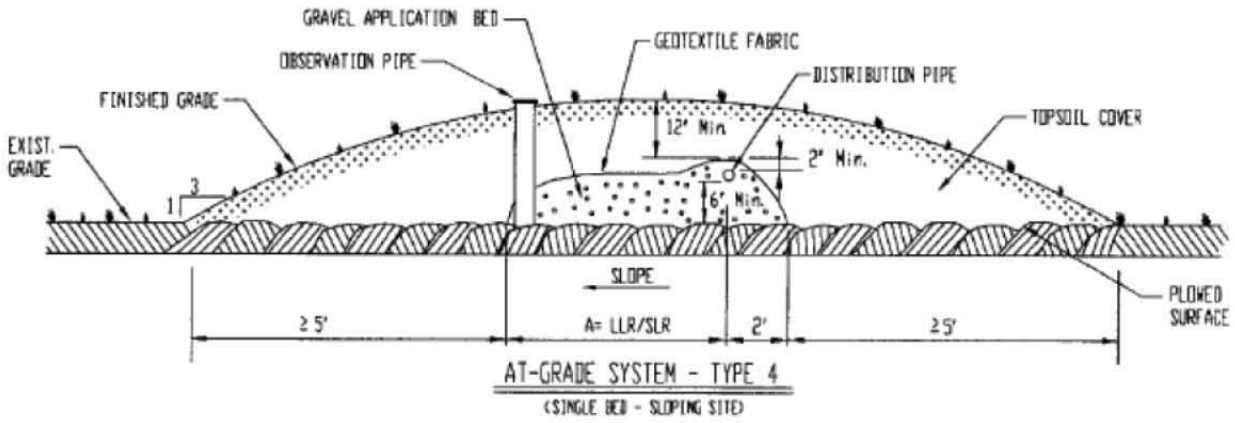
AT-GRADE SYSTEM - TYPE 4
(SINGLE BED - LEVEL SITE)



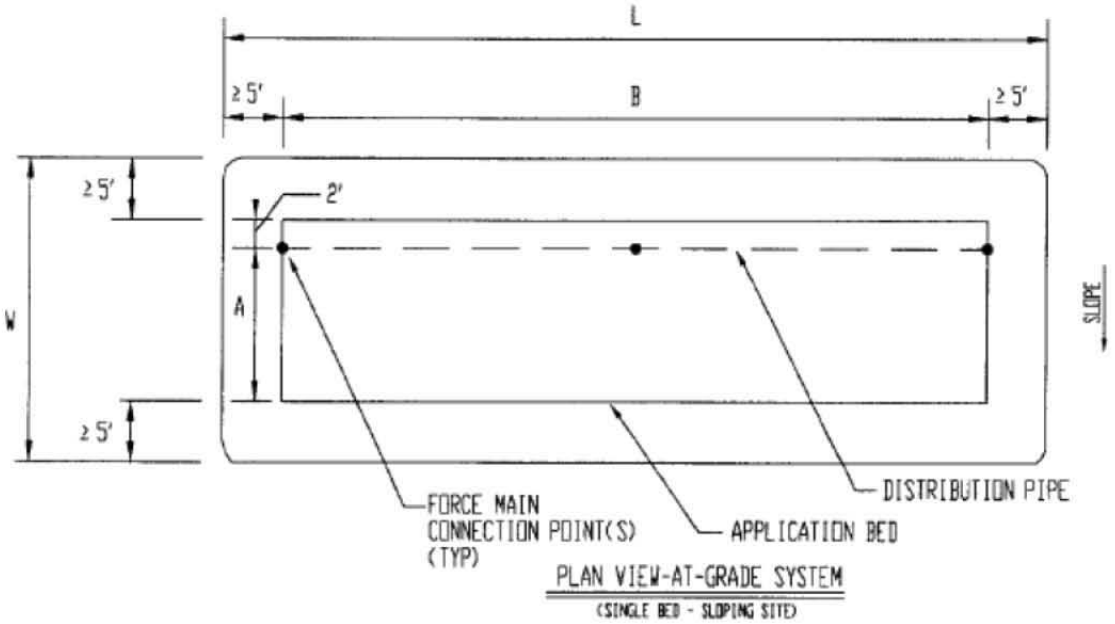
PLAN VIEW-AT-GRADE SYSTEM
(SINGLE BED - LEVEL SITE)

* Observation pipes may be installed in the application bed.

Figure N.2 At-Grade System: Single Bed, Sloping Site



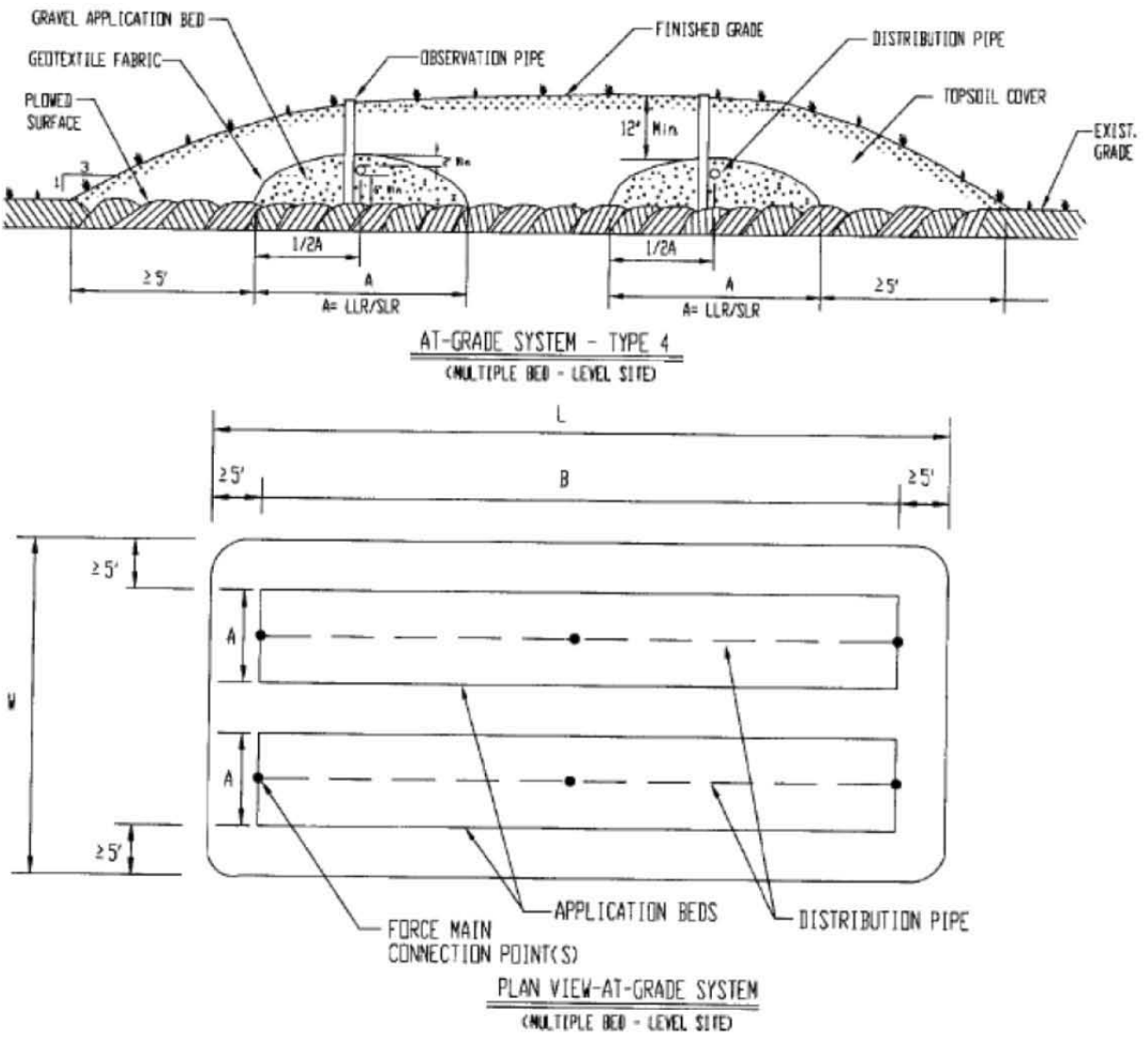
AT-GRADE SYSTEM - TYPE 4
(SINGLE BED - SLOPING SITE)



PLAN VIEW-AT-GRADE SYSTEM
(SINGLE BED - SLOPING SITE)

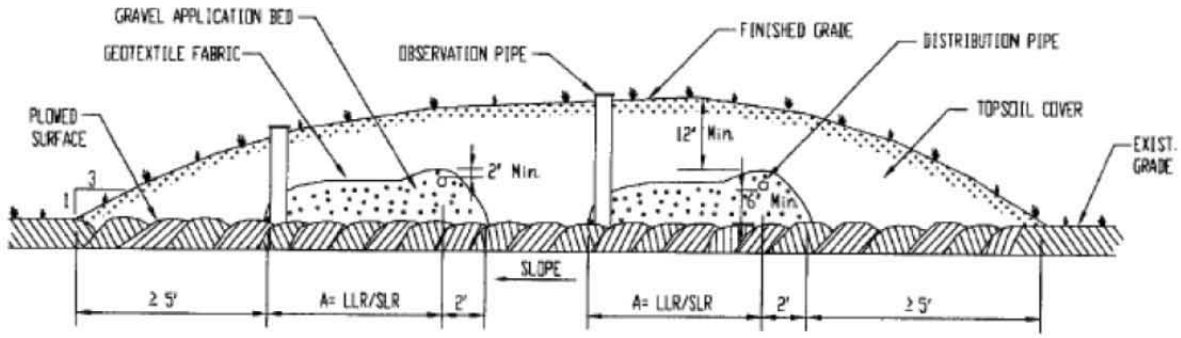
* Force main must connect to the distribution pipe from the upslope or the endslope. The force main cannot be located in the downslope area on landslopes of 2% or greater.
* Observation pipes may be installed in the application bed.

Figure N.3 At-Grade System: Multiple Bed, Level Site

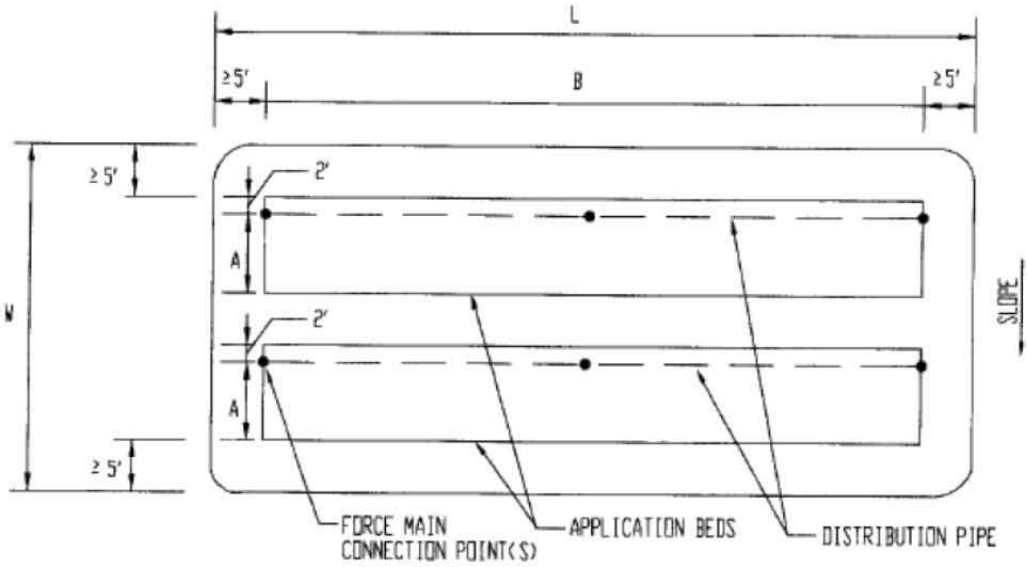


* Observation pipes may be installed in the application bed.

Figure N.4 At-Grade System: Multiple Bed, Sloping Site



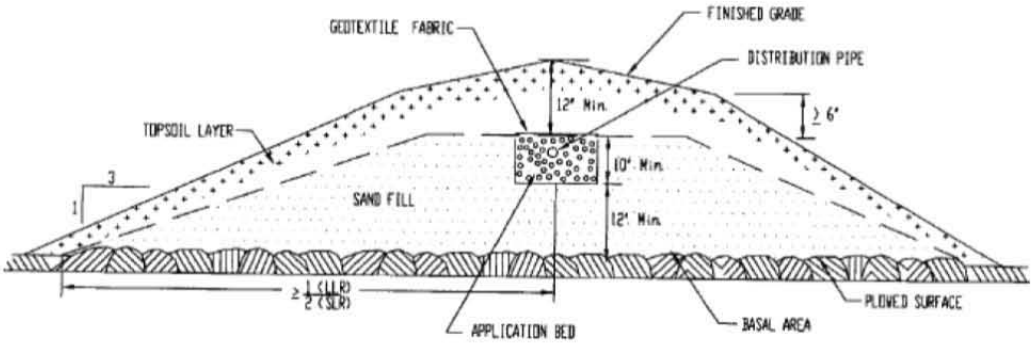
AT-GRADE SYSTEM - TYPE 4
(MULTIPLE BEDS - SLOPING SITE)



PLAN VIEW-AT-GRADE SYSTEM
(MULTIPLE BEDS - SLOPING SITE)

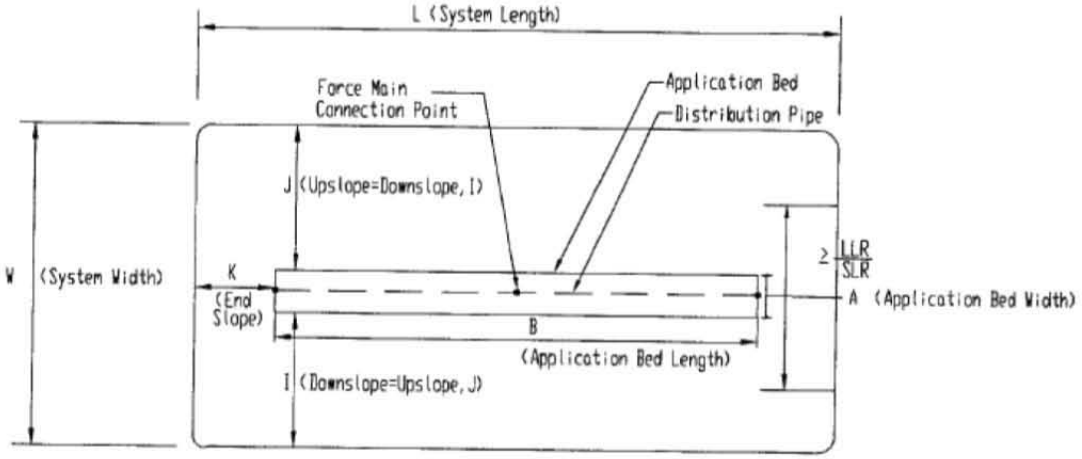
* Force main must connect to the distribution pipe from the upslope or the endslope. The force main cannot be located in the downslope area on landslopes of 2% or greater.
* Observation pipes may be installed in the application bed.

Figure N.5 Mound System: Single Bed, Level Site



MOUND SYSTEM - TYPE 5

(SINGLE BED - LEVEL SITE)

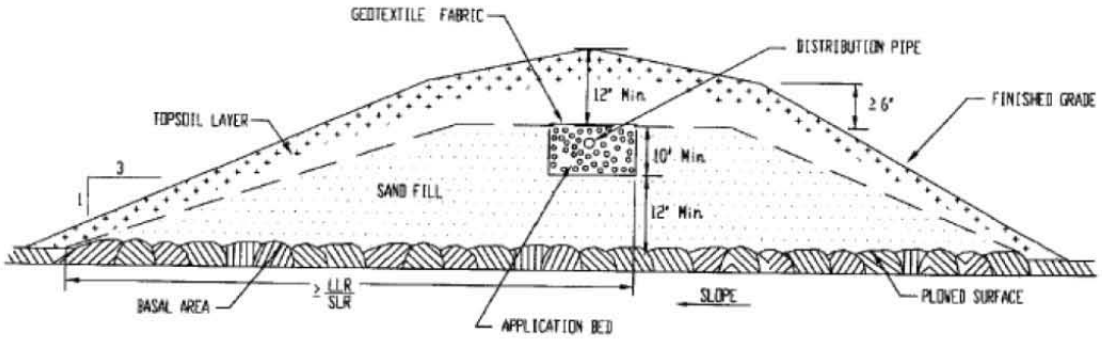


PLAN VIEW FOR MOUND

(N.T.S.)

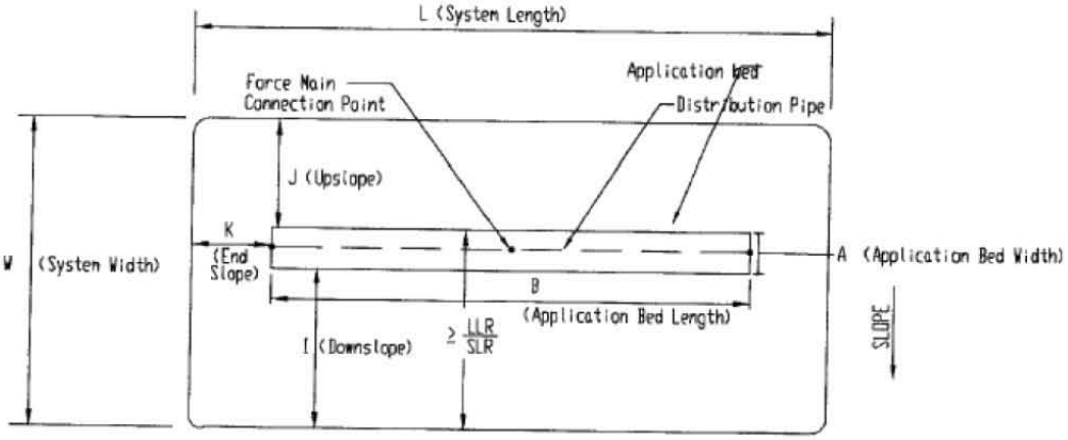
* Observation pipes may be installed in the application bed.

Figure N.6 Mound System: Single Bed, Sloping Site



MOUND SYSTEM - TYPE 5

(SINGLE BED - SLOPING SITE)



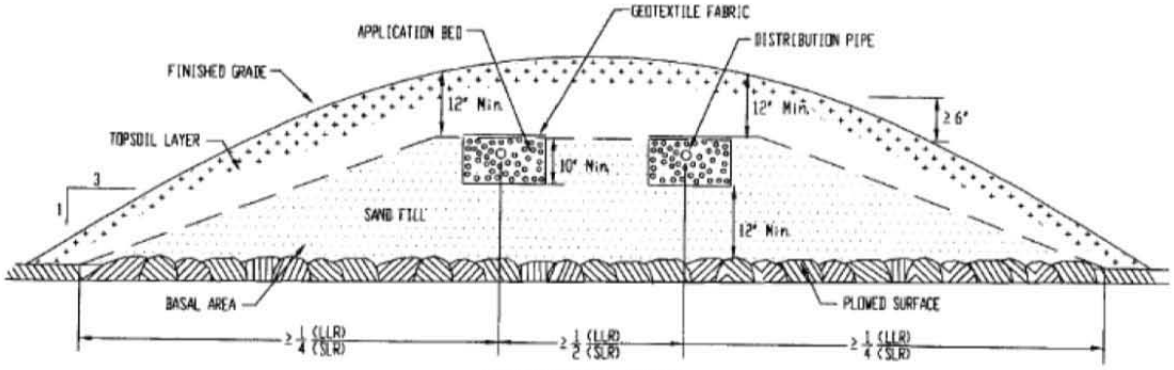
PLAN VIEW FOR MOUND

(N.T.S.)

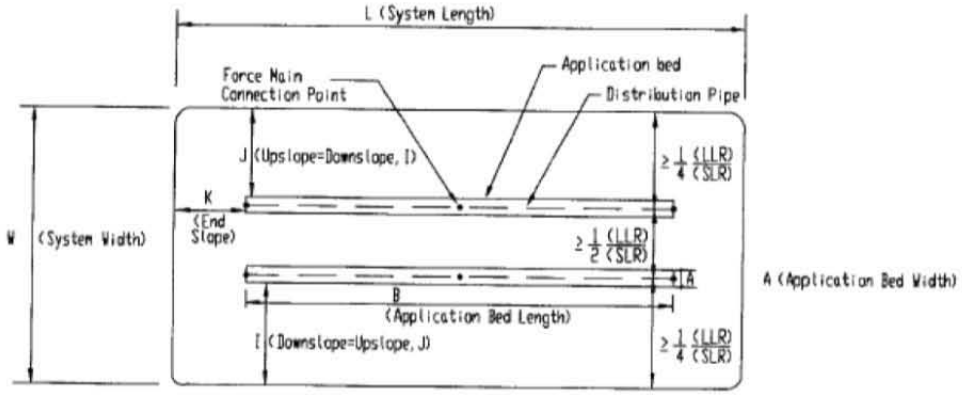
* Force main must connect to the distribution pipe from the upslope(J) or the endslope(K). The force main cannot be located in the downslope area(I) on landslopes of 2% or greater.

* Observation pipes may be installed in the application bed.

Figure N.7 Mound System: Multiple Bed, Level Site



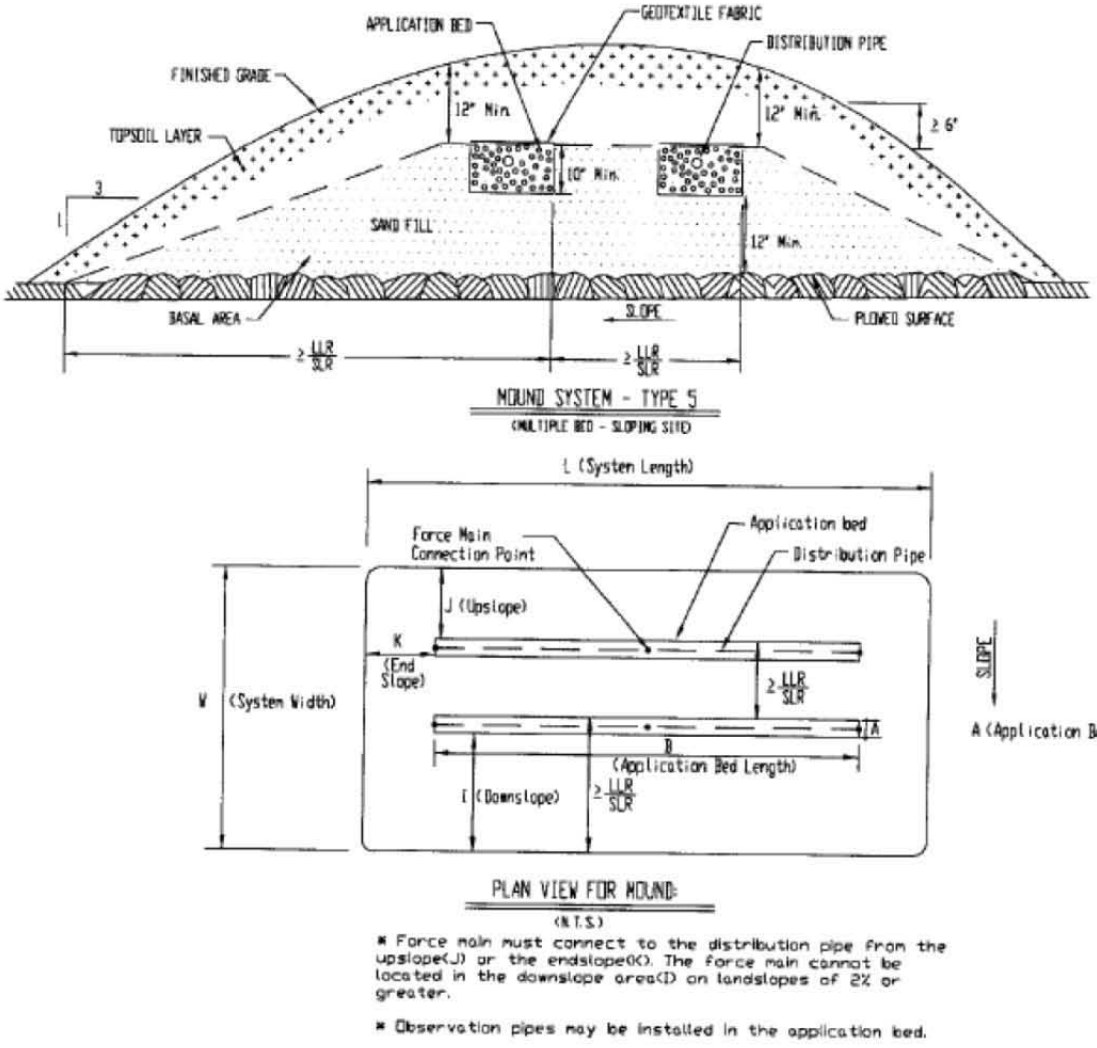
MOUND SYSTEM - TYPE 5
(MULTIPLE BED - LEVEL SITE)



PLAN VIEW FOR MOUND
(N.T.S.)

* Observation pipes may be installed in the application bed.

Figure N.8 Mound System: Multiple Bed, Sloping Site



* Force main must connect to the distribution pipe from the upslope(J) or the endslope(K). The force main cannot be located in the downslope area(I) on landslopes of 2% or greater.

* Observation pipes may be installed in the application bed.

GHA GEWALT HAMILTON ASSOCIATES, INC.
CONSULTING ENGINEERS
625 Forest Edge Drive, Vernon Hills, IL 60061
TEL 847.478.9700 ▪ FAX 847.478.9701
www.gha-engineers.com

Memorandum

To: Village of Barrington Hills - Board of Health

From: Caitlin Burke, Gewalt Hamilton Associates, Inc.

Date: May 6, 2015

Re: Village of Barrington Hills – Well Water Quality Testing Results

---

Location	Parameters of Concern					Notes
	Dissolved Solids	Iron	Barium	Strontium	Color	
New Friends Wesleyan Church*						Moderately mineralized & soft
Presbyterian Church of Barrington*					**x**	Moderately mineralized & soft
Barrington United Methodist*						Moderately mineralized & soft
St. Mark's Church*	**x**					Highly mineralized & soft
Countryside Elementary		**x**				Moderately mineralized & very hard
Barrington Hills Park District		**x**				Moderately mineralized & very hard
Bellarmine Hall			**x**	**x**		Moderately mineralized & hard
Bellarmine Jesuit Retreat House	**x**	**x**				Moderately mineralized & extremely hard
Barrington Hills Village Hall		**x**				Moderately mineralized & hard

*May have passed through a water softener – need to re-sample.

The results of the Level 2 Groundwater Quality Testing show that for all locations, the content of *arsenic* in the samples are well below the Federal Maximum Contaminant Level (MCL) of 10 µg/L, and the content of *nitrate* in the samples are well below the Federal MCL of 10 mg/L.

Parameters of concern (marked with an "**x**") are explained below:

- High levels of *dissolved solids* may impart an unpleasant taste to the water.
- High levels of *iron* present only aesthetic concerns – potential staining of porcelain and laundry, increased turbidity due to oxidized iron, and formation of scale in hot water heaters.
- The level of *barium* present at Bellarmine Hall exceeds the Federal MCL of 3 mg/L.
- The level of *strontium* present at Bellarmine Hall exceeds the current lifetime health advisory limit of 4 mg/L.
- Natural *color* seen in the sample at Presbyterian Church presents only aesthetic concerns – could be attributed to tannins (natural organic materials) or precipitated iron.

Addition of a sediment filter and a softener would likely reduce/remove iron and hardness from the water, as well as barium and strontium.

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WATER SURVEY
PRAIRIE RESEARCH INSTITUTE

2204 Griffith Drive • Champaign, IL 61820
T 217-333-2210 • F 217-333-4983
www.isws.illinois.edu

April 20, 2015

Ms. Caitlin Burke
625 Forest Edge Drive
Vernon Hills, IL 60061

Dear Ms. Burke:

We are enclosing a copy of the analysis made on a sample of water collected March 17, 2015, from a 184 foot well owned by St. Mark's Church in Lake County. Relevant sample number is: 237915.

The analysis shows this sample to be highly mineralized but soft, as if it had been passed through a water softener. Because the water is soft, I would not expect scale formation or excessive soap consumption to be a problem.

The arsenic content of this sample is well below the Federal Maximum Contaminant Level of 10 µg/L. The nitrate (as N) content of this sample is well below the Federal Maximum Contaminant Level of 10 mg/L.

The water has a high dissolved solids content. This can impart a taste to the water that some individuals may find unpleasant.

None of the other parameters tested appear unusual or excessive for Illinois ground water. However, our laboratory is only capable of identifying a limited number of the contaminants found in the Safe Drinking Water Act. Testing for bacteria, radionuclides, and synthetic organic contaminants, if desired, must be arranged through other laboratories. A listing of such laboratories can be found at www.epa.state.il.us/well-water/list-accredited-labs.html or in your yellow pages under "water".

If we can be of further assistance, please let us hear from you.

Sincerely,

Daniel L. Webb

Daniel L. Webb
Lab Supervisor, Chemistry & Technology Section
217/244-0625

jt

cc: BACOG

The analytical methods used for the samples are as follows:

US EPA 200.7: Metals and Trace Elements by Inductively Coupled Argon Plasma-Atomic Emission Spectrometry:

iron, Fe	sodium, Na	nickel, Ni	beryllium, Be
manganese, Mn	barium, Ba	copper, Cu	potassium, K
calcium, Ca	boron, B	zinc, Zn	cobalt, Co
magnesium, Mg	chromium, Cr	aluminum, Al	lithium, L
molybdenum, Mo	strontium, Sr	tin, Sn	titanium, Ti
vanadium, V	silica, SiO_2	phosphorus, P	sulfur, S

US EPA Method 300.0: Inorganic anions by Ion Chromatography

chloride, Cl nitrate, NO_3-N sulfate, SO_4 fluoride, F bromide, Br

US EPA Method 200.9: Trace Elements by Graphite Furnace Atomic Absorption Spectrometry

arsenic, As

US EPA Method 150.1: pH, Electrometric

SM19, 2320-B: Alkalinity, electrometric titration, mg/L as $CaCO_3$

SM18,2540-C: Total Dissolved Solids Dried at 180°C

US EPA Method 180.1: Turbidity by Nephelometry

Hach Method 8025: Color, Platinum-Cobalt Standard Method

SM18,2340-B: Hardness by Calculation

SM18, 5310B: Non-volatile Organic Carbon

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WATER SURVEY
PRAIRIE RESEARCH INSTITUTE

2204 Griffith Drive • Champaign, IL 61820
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WATER SAMPLE DATA
LABORATORY SAMPLE NUMBER: 237915

SOURCE: PRIVATE WELL
WELL#:
LOCATION: BARRINGTON HILLS
COUNTY: LAKE
TOWNSHIP: 43N
RANGE: 09E
SECTION: 28
PLOT: 8F
TREATMENT:

OWNER: ST MARKS CHURCH
WELL DEPTH: 184.00
DATE COLLECTED: 3/17/2015
DATE RECEIVED: 3/18/2015
FIELD TEMPERATURE (F): ND
COMMENTS: SAMPLE COLLECTED FROM KITCHEN SINK COLD WATER TAP. PAGE 3 OF 3.

PARAMETER		RESULT	UNITS
Iron (Total Fe):		0.078	mg/L
Potassium (K):		1.51	mg/L
Calcium (Ca):		0.152	mg/L
Magnesium (Mg):		0.064	mg/L
Sodium (Na):		266	mg/L
Aluminum (Al):	<	37	µg/L
Arsenic (As):	<	0.95	µg/L
Barium (Ba):	<	0.85	µg/L
Beryllium (Be):	<	0.55	µg/L
Boron (B):		24	µg/L
Chromium (Cr):	<	5.8	µg/L
Cobalt (Co):	<	13	µg/L
Copper (Cu):		11.6	µg/L
Lithium (Li):	<	110	µg/L
Manganese (Mn):	<	1.5	µg/L
Molybdenum (Mo):	<	22	µg/L
Nickel (Ni):	<	43	µg/L
Strontium (Sr):	<	0.37	µg/L
Tin (Sn):	<	86	µg/L
Titanium (Ti):	<	0.56	µg/L
Vanadium (V):	<	47	µg/L
Zinc (Zn):		78.9	µg/L

PARAMETER		RESULT	UNITS
Fluoride (F):		0.24	mg/L
Chloride (Cl):		60.4	mg/L
Nitrate (NO3-N):	<	0.04	mg/L
Phosphorus (P):	<	0.073	mg/L
Sulfate (SO4):		79.6	mg/L
Sulfur (S):		28.2	mg/L
Bromide (Br)	<	0.08	mg/L
Turbidity (Lab, NTU):		0.6	NTU
Color (PCU):	<	5	PCU
pH (Lab):		7.85	
Alkalinity (CaCO3):		402	mg/L
Hardness (as CaCO3):		0.64	mg/L
Silica (SiO2):		21.5	mg/L
Total Dissolved Solids:		657	mg/L
Non-Volatile Org. Carbon (Tot., as C):		0.65	mg/L

< = Below detection limit (i.e. < 1.0 = less than 1.0)
mg/L = milligrams per liter
ND = Not determined/Information not available

ug/L = micrograms per Liter
hardness = (Ca mg/L * 2.497) + (Mg mg/L * 4.118)
1 mg/L = 1000 ug/L

Analyzed by: Omar Ali, Rita Bargon, Tanya Grandt, Ruth Ann Nichols, Kaye J Surratt, and Daniel L Webb

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WATER SURVEY
PRAIRIE RESEARCH INSTITUTE

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T 217-333-2210 • F 217-333-4983
www.isws.illinois.edu

April 20, 2015

Ms. Caitlin Burke
625 Forest Edge Drive
Vernon Hills, IL 60061

Dear Ms. Burke:

We are enclosing a copy of the analysis made on a sample of water collected March 17, 2015, from a well owned by Presbyterian Church of Barrington in Cook County. Relevant sample number is: 237917.

The analysis shows this sample to be moderately mineralized but soft, as if it had been passed through a water softener. The iron content of this water is at a level which can result in the staining of porcelain and laundry. Because the water is soft, I would not expect scale formation or excessive soap consumption to be a problem.

The arsenic content of this sample is well below the Federal Maximum Contaminant Level of 10 µg/L. The nitrate (as N) content of this sample is below the Federal Maximum Contaminant Level of 10 mg/L.

There seemed to be a natural color to your water. This is often attributed to tannins, which are natural organic materials typically resulting from decaying vegetation. Although these are not typically considered a health risk, they can be aesthetically displeasing. Color can also result from precipitated iron, but a separate non-volatile organic carbon (NVOC) test confirmed the presence of a small amount of organic material in your sample. If removal of this color is important to you, we suggest seeking treatment advice from a local water treatment dealer.

None of the other parameters tested appear unusual or excessive for Illinois ground water. However, our laboratory is only capable of identifying a limited number of the contaminants found in the Safe Drinking Water Act. Testing for bacteria, radionuclides, and synthetic organic contaminants, if desired, must be arranged through other laboratories. A listing of such laboratories can be found at www.epa.state.il.us/well-water/list-accredited-labs.html or in your yellow pages under "water".

If we can be of further assistance, please let us hear from you.

Sincerely,

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iron, Fe	sodium, Na	nickel, Ni	beryllium, Be
manganese, Mn	barium, Ba	copper, Cu	potassium, K
calcium, Ca	boron, B	zinc, Zn	cobalt, Co
magnesium, Mg	chromium, Cr	aluminum, Al	lithium, L
molybdenum, Mo	strontium, Sr	tin, Sn	titanium, Ti
vanadium, V	silica, SiO_2	phosphorus, P	sulfur, S

US EPA Method 300.0: Inorganic anions by Ion Chromatography

chloride, Cl nitrate, NO_3-N sulfate, SO_4 fluoride, F bromide, Br

US EPA Method 200.9: Trace Elements by Graphite Furnace Atomic Absorption Spectrometry

arsenic, As

US EPA Method 150.1: pH, Electrometric

SM19, 2320-B: Alkalinity, electrometric titration, mg/L as $CaCO_3$

SM18,2540-C: Total Dissolved Solids Dried at 180°C

US EPA Method 180.1: Turbidity by Nephelometry

Hach Method 8025: Color, Platinum-Cobalt Standard Method

SM18,2340-B: Hardness by Calculation

SM18, 5310B: Non-volatile Organic Carbon

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WATER SAMPLE DATA
LABORATORY SAMPLE NUMBER: 237917

SOURCE: PRIVATE WELL
WELL#:
LOCATION: BARRINGTON HILLS
COUNTY: COOK
TOWNSHIP: 42N
RANGE: 09E
SECTION: 03
PLOT:
TREATMENT:

OWNER: PRESBYTERIAN CHURCH OF BARRINGTON
WELL DEPTH:
DATE COLLECTED: 3/17/2015
DATE RECEIVED: 3/18/2015
FIELD TEMPERATURE (F): ND
COMMENTS: SAMPLE COLLECTED FROM OUTDOOR SPIGOT. PAGE 3 OF 3.

PARAMETER		RESULT	UNITS
Iron (Total Fe):		1.55	mg/L
Potassium (K):		3.00	mg/L
Calcium (Ca):		0.280	mg/L
Magnesium (Mg):		0.084	mg/L
Sodium (Na):		208	mg/L
Aluminum (Al):	<	37	µg/L
Arsenic (As):	<	0.95	µg/L
Barium (Ba):	<	0.85	µg/L
Beryllium (Be):	<	0.55	µg/L
Boron (B):		41	µg/L
Chromium (Cr):	<	5.8	µg/L
Cobalt (Co):	<	13	µg/L
Copper (Cu):		9.7	µg/L
Lithium (Li):	<	110	µg/L
Manganese (Mn):		7.1	µg/L
Molybdenum (Mo):	<	22	µg/L
Nickel (Ni):	<	43	µg/L
Strontium (Sr):		0.79	µg/L
Tin (Sn):	<	86	µg/L
Titanium (Ti):	<	0.56	µg/L
Vanadium (V):	<	47	µg/L
Zinc (Zn):		171	µg/L

PARAMETER		RESULT	UNITS
Fluoride (F):		0.15	mg/L
Chloride (Cl):		67.5	mg/L
Nitrate (NO3-N):	<	0.04	mg/L
Phosphorus (P):	<	0.073	mg/L
Sulfate (SO4):		15.2	mg/L
Sulfur (S):		5.72	mg/L
Bromide (Br)	<	0.08	mg/L
Turbidity (Lab, NTU):		1.2	NTU
Color (PCU):		35	PCU
pH (Lab):		7.55	
Alkalinity (CaCO3):		322	mg/L
Hardness (as CaCO3):		1.04	mg/L
Silica (SiO2):		19.6	mg/L
Total Dissolved Solids:		491	mg/L
Non-Volatile Org. Carbon (Tot., as C):		1.95	mg/L

< = Below detection limit (i.e. < 1.0 = less than 1.0)
mg/L = milligrams per liter
ND = Not determined/Information not available

ug/L = micrograms per Liter
hardness = (Ca mg/L * 2.497) + (Mg mg/L * 4.118)
1 mg/L = 1000 ug/L

Analyzed by: Omar Ali, Rita Bargon, Tanya Grandt, Ruth Ann Nichols, Kaye J Surratt, and Daniel L Webb

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April 20, 2015

Ms. Caitlin Burke
625 Forest Edge Drive
Vernon Hills, IL 60061

Dear Ms. Burke:

We are enclosing a copy of the analysis made on a sample of water collected March 17, 2015, from a 165 foot well owned by New Friends Wesleyan Church in Cook County. Relevant sample number is: 237918.

The analysis shows this sample to be moderately mineralized and soft, as if it had been passed through a water softener. The iron and manganese levels are low enough that I would not expect staining due to these elements. Because the water is soft, I would not expect scale formation or excessive soap consumption to be a problem.

The arsenic content of this sample is well below the Federal Maximum Contaminant Level of 10 µg/L. The nitrate (as N) content of this sample is well below the Federal Maximum Contaminant Level of 10 mg/L.

None of the other parameters tested appear unusual or excessive for Illinois ground water. However, our laboratory is only capable of identifying a limited number of the contaminants found in the Safe Drinking Water Act. Testing for bacteria, radionuclides, and synthetic organic contaminants, if desired, must be arranged through other laboratories. A listing of such laboratories can be found at www.epa.state.il.us/well-water/list-accredited-labs.html or in your yellow pages under "water".

If we can be of further assistance, please let us hear from you.

Sincerely,

Daniel L. Webb

Daniel L. Webb
Lab Supervisor, Chemistry & Technology Section
217/244-0625

jt

cc: BACOG

The analytical methods used for the samples are as follows:

US EPA 200.7: Metals and Trace Elements by Inductively Coupled Argon Plasma-Atomic Emission Spectrometry:

iron, Fe	sodium, Na	nickel, Ni	beryllium, Be
manganese, Mn	barium, Ba	copper, Cu	potassium, K
calcium, Ca	boron, B	zinc, Zn	cobalt, Co
magnesium, Mg	chromium, Cr	aluminum, Al	lithium, L
molybdenum, Mo	strontium, Sr	tin, Sn	titanium, Ti
vanadium, V	silica, SiO_2	phosphorus, P	sulfur, S

US EPA Method 300.0: Inorganic anions by Ion Chromatography

chloride, Cl nitrate, NO_3-N sulfate, SO_4 fluoride, F bromide, Br

US EPA Method 200.9: Trace Elements by Graphite Furnace Atomic Absorption Spectrometry

arsenic, As

US EPA Method 150.1: pH, Electrometric

SM19, 2320-B: Alkalinity, electrometric titration, mg/L as $CaCO_3$

SM18,2540-C: Total Dissolved Solids Dried at 180°C

US EPA Method 180.1: Turbidity by Nephelometry

Hach Method 8025: Color, Platinum-Cobalt Standard Method

SM18,2340-B: Hardness by Calculation

SM18, 5310B: Non-volatile Organic Carbon

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WATER SAMPLE DATA
LABORATORY SAMPLE NUMBER: 237918

SOURCE: PRIVATE WELL
WELL#:
LOCATION: BARRINGTON HILLS
COUNTY: COOK
TOWNSHIP: 42N
RANGE: 09E
SECTION: 16
PLOT: 6A
TREATMENT:

OWNER: NEW FRIENDS WESLEYAN CHURCH
WELL DEPTH: 165.00
DATE COLLECTED: 3/17/2015
DATE RECEIVED: 3/18/2015
FIELD TEMPERATURE (F): ND
COMMENTS: SAMPLE COLLECTED FROM OUTDOOR SPIGOT. PAGE 3 OF 3.

PARAMETER		RESULT	UNITS
Iron (Total Fe):	<	0.024	mg/L
Potassium (K):		0.422	mg/L
Calcium (Ca):		0.067	mg/L
Magnesium (Mg):		0.050	mg/L
Sodium (Na):		188	mg/L
Aluminum (Al):	<	37	µg/L
Arsenic (As):	<	0.95	µg/L
Barium (Ba):	<	0.85	µg/L
Beryllium (Be):	<	0.55	µg/L
Boron (B):		171	µg/L
Chromium (Cr):	<	5.8	µg/L
Cobalt (Co):	<	13	µg/L
Copper (Cu):		3.0	µg/L
Lithium (Li):	<	110	µg/L
Manganese (Mn):	<	1.5	µg/L
Molybdenum (Mo):	<	22	µg/L
Nickel (Ni):	<	43	µg/L
Strontium (Sr):		0.61	µg/L
Tin (Sn):	<	86	µg/L
Titanium (Ti):	<	0.56	µg/L
Vanadium (V):	<	47	µg/L
Zinc (Zn):		12.0	µg/L

PARAMETER		RESULT	UNITS
Fluoride (F):		0.60	mg/L
Chloride (Cl):		4.56	mg/L
Nitrate (NO3-N):	<	0.04	mg/L
Phosphorus (P):	<	0.073	mg/L
Sulfate (SO4):		40.3	mg/L
Sulfur (S):		14.8	mg/L
Bromide (Br)	<	0.08	mg/L
Turbidity (Lab, NTU):		0.2	NTU
Color (PCU):	<	5	PCU
pH (Lab):		8.00	
Alkalinity (CaCO3):		338	mg/L
Hardness (as CaCO3):		0.38	mg/L
Silica (SiO2):		17.7	mg/L
Total Dissolved Solids:		430	mg/L
Non-Volatile Org. Carbon (Tot., as C):	<	0.31	mg/L

< = Below detection limit (i.e. < 1.0 = less than 1.0)
mg/L = milligrams per liter
ND = Not determined/Information not available

ug/L = micrograms per Liter
hardness = (Ca mg/L * 2.497) + (Mg mg/L * 4.118)
1 mg/L = 1000 ug/L

Analyzed by: Omar Ali, Rita Bargon, Tanya Grandt, Ruth Ann Nichols, Kaye J Surratt, and Daniel L Webb

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UNDERSTANDING YOUR WATER QUALITY ANALYSIS

Having your well water tested is an important step to ensure safe drinking water. The U.S. Environmental Protection Agency establishes drinking water standards, such as maximum contaminant levels (MCL) and secondary maximum contaminant levels (SMCL), and public water supplies are required to test their water routinely for a list of regulated contaminants. For private well owners, however, water testing is their responsibility. The following guide is intended to help customers understand the results of their water quality analysis.

Analyte	Description	MCL (or SMCL, if noted)	Source	Websites (for more information)
Alkalinity	Measure of bicarbonate, carbonate, or hydroxide constituents; not detrimental to humans; IDPH recommends 30-400 mg/L for drinking water.		IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
Aluminum	Above the SMCL may result in colored water.	0.05 to 0.2 mg/L	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
Arsenic	Naturally occurring in some groundwater throughout Illinois. EPA indicates some people who drink water containing arsenic in excess of the MCL for many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.	0.010 mg/L (=10 µg/L)	ISWS	http://www.isws.illinois.edu/gws/archive/arsenic/ilsources.asp
			US EPA	http://water.epa.gov/drink/contaminants/index.cfm
Barium	Naturally occurring, possible discharge of drilling wastes and metal refineries; erosion of natural deposits. Some people who drink water containing barium in excess of the maximum contaminant level (MCL) for many years could experience an increase in their blood pressure.	2 mg/L	US EPA	http://water.epa.gov/drink/contaminants/index.cfm
				http://water.epa.gov/drink/contaminants/basicinformation/barium.cfm
Beryllium	Naturally enters water through the weathering of rocks and soils or from industrial wastewater discharges. Some people who drink water containing beryllium in excess of the maximum contaminant level (MCL) for many years could develop intestinal lesions.	0.004 mg/L (=4 µg/L)	US EPA	http://water.epa.gov/drink/contaminants/index.cfm
				http://water.epa.gov/drink/contaminants/basicinformation/beryllium.cfm
Calcium	(See hardness)			
Chloride	Naturally occurring; runoff from road deicing; pollution from brine or industrial or domestic wastes; high levels can cause salty taste and be corrosive to iron pipe.	SMCL = 250 mg/L	IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
			US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
Chromium	Found naturally in rocks, plants; most common forms of chromium that occur in natural waters are trivalent chromium (chromium-3), and hexavalent chromium (chromium-6). Chromium-3 is a nutritionally essential element in humans and is often added to vitamins as a dietary supplement. Chromium-3 has relatively low toxicity and would be a concern in drinking water only at very high levels of contamination; Chromium-6 is more toxic and poses potential health risks (allergic dermatitis, possibly carcinogenic).	0.1 mg/L	US EPA	http://water.epa.gov/drink/contaminants/index.cfm
Color	Visible tint in the water (yellow/tan/brown); can be caused by decaying vegetation.	SMCL = 15 units	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
Copper	Short-term = gastrointestinal distress, and with long-term exposure may experience liver or kidney damage. Treatment technique regulation-action level 1.3 mg/L; SMCL = 1.0 mg/L (above SMCL = metallic taste; blue-green staining)	1.3 mg/L; 1.0 mg/L	US EPA	http://water.epa.gov/drink/contaminants/basicinformation/copper.cfm
Fluoride	Commonly added to community supplies (to 1 mg/L) to promote dental health. Excessive consumption over a lifetime may lead to increased likelihood of bone fractures in adults, and may result in effects on bone leading to pain and tenderness. Children may have an increased chance of developing pits in the tooth enamel, along with a range of cosmetic effects to teeth. EPA has both an MCL and a SMCL.	4 mg/L	US EPA	http://water.epa.gov/drink/contaminants/index.cfm
		SMCL = 2 mg/L	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm

Analyte	Description	EPA MCL or SMCL	Source	Websites (for more information)
Hardness	Generally caused by calcium and magnesium minerals. Affects consumption of soap; causes scale. Generally removed using a water softener. Calcium can form scale when heated. IDPH: The following is a measure of hardness (expressed in mg/L as calcium carbonate): 0 - 100 Soft 100 - 200 Moderate 200 - 300 Hard 300 - 500 Very hard 500 - 1,000 Extremely hard May also be expressed in grains per gallon. The conversion formula is: 1 gpg = 17.1 mg/L.		ISWS	http://www.isws.uiuc.edu/pubdoc/C/ISWSC-118.pdf
			IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
Iron	Naturally occurring as soluble Iron (II), but oxidizes to Iron(III); rusty color; sediment; metallic taste; reddish or orange staining; removed by physical filtration, iron filter, water softener	SMCL = 0.3 mg/L	IDPH	http://www.idph.state.il.us/envhealth/factsheets/ironFS.htm
			IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
			US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
Magnesium	(See hardness)			
Manganese	Naturally occurring; black to brown color; black staining; bitter metallic taste	SMCL = 0.05 mg/L	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
Nickel	No current EPA limit; has potential to cause the following health effects from long-term exposure at levels above the MCL: decreased body weight; heart and liver damage; dermatitis.	Old MCL = 0.1 mg/L	US EPA	http://www.epa.gov/ogwdw/pdfs/factsheets/ioc/tech/nickel.pdf
Nitrate	Often used in fertilizer. Infants below six months who drink water containing nitrate in excess of the maximum contaminant level (MCL) could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome (methemoglobinemia).	10 mg/L as N	US EPA	http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm
pH	Low pH: bitter metallic taste; corrosion high pH: slippery feel; soda taste; deposits desirable range = 6.5-8.5	SMCL = 6.5-8.5	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
			IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
Sodium	No curent federal drinking water standard; high levels may be associated with hypertension in some individuals, but typically the majority of sodium ingestion is from food rather than drinking water. Water softening will increase sodium.		US EPA	http://water.epa.gov/scitech/drinkingwater/dws/ccl/sodium.cfm
Sulfate	Naturally occurring; high levels can cause laxative effect, especially if changing from water supply with low sulfates. Coal mining can contribute. IDPH states: 0-250 mg/L=acceptable; 250-500 mg/L=can be tolerated; 500-1000 mg/L=undesirable; over 1000 mg/L=unsatisfactory	SMCL = 250 mg/L	ISWS	http://www.isws.uiuc.edu/pubdoc/C/ISWSC-118.pdf
			IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
			US EPA	http://water.epa.gov/drink/contaminants/unregulated/sulfate.cfm
Total Dissolved Solids	Measure of the total amount of dissolved minerals/substances in water; high levels may cause salty taste IDPH states: less than 500 mg/L= satisfactory; 500 - 1000 mg/L= less than desirable; 1000-1500 mg/L= undesirable; over 1500 mg/L= unsatisfactory	SMCL = 500 mg/L	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm
			IDPH	http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf
Turbidity	Turbidity refers to cloudiness of water. Often due to sand, silt, clay, or precipitated iron (see also iron). Turbidity has no health effects, but can be an indication of the presence of disease-causing organisms.	n/a. See EPA website for info	US EPA	http://water.epa.gov/drink/contaminants/index.cfm
Zinc	Metallic taste	SMCL = 5 mg/L	US EPA	http://water.epa.gov/drink/contaminants/secondarystandards.cfm

Notes:
MCL = Maximum Contaminant Level (Set by US EPA and is generally the maximum level allowed for public water systems)
SMCL = Secondary Maximum Contaminant Level (non-mandatory guidelines for aestheic considerations; generally analyte is not considered a risk to human health)
US EPA = United States Environmental Protection Agency
IDPH = Illinois Department of Public Health
mg/L = milligrams per liter; this is the same as parts per million (ppm)
µg/L = micrograms per liter; this is the same as parts per billion (ppb)
List of all EPA drinking water contaminants: http://water.epa.gov/drink/contaminants/index.cfm

ISWSC-185; 01/2013; D. Webb, G. Czapar

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April 20, 2015

Ms. Caitlin Burke
625 Forest Edge Drive
Vernon Hills, IL 60061

Dear Ms. Burke:

We are enclosing a copy of the analysis made on a sample of water collected March 17, 2015, from a well owned by Countryside Elementary in Cook County. Relevant sample number is: 237922.

The analysis shows this sample to be moderately mineralized and very hard. The iron content of this water is at a level which can result in the staining of porcelain and laundry. A major portion of the turbidity in this sample appears to be due to the previously soluble iron which oxidized and became insoluble after the water was exposed to air. The hardness in this sample is sufficient to cause the formation of a large amount of scale in hot water heaters, and to increase consumption of soap when used for washing or laundry purposes.

The arsenic content of this sample is well below the Federal Maximum Contaminant Level of 10 µg/L. The nitrate (as N) content of this sample is below the Federal Maximum Contaminant Level of 10 mg/L.

The aesthetic quality of this water would likely be improved with the addition of a sediment filter and water softener to remove iron and hardness.

None of the other parameters tested appear unusual or excessive for Illinois ground water. However, our laboratory is only capable of identifying a limited number of the contaminants found in the Safe Drinking Water Act. Testing for bacteria, radionuclides, and synthetic organic contaminants, if desired, must be arranged through other laboratories. A listing of such laboratories can be found at www.epa.state.il.us/well-water/list-accredited-labs.html or in your yellow pages under "water".

If we can be of further assistance, please let us hear from you.

Sincerely,

Daniel L. Webb

Daniel L. Webb
Lab Supervisor, Chemistry & Technology Section
217/244-0625

jt

cc: BACOG

The analytical methods used for the samples are as follows:

US EPA 200.7: Metals and Trace Elements by Inductively Coupled Argon Plasma-Atomic Emission Spectrometry:

iron, Fe	sodium, Na	nickel, Ni	beryllium, Be
manganese, Mn	barium, Ba	copper, Cu	potassium, K
calcium, Ca	boron, B	zinc, Zn	cobalt, Co
magnesium, Mg	chromium, Cr	aluminum, Al	lithium, L
molybdenum, Mo	strontium, Sr	tin, Sn	titanium, Ti
vanadium, V	silica, SiO_2	phosphorus, P	sulfur, S

US EPA Method 300.0: Inorganic anions by Ion Chromatography

chloride, Cl nitrate, NO_3-N sulfate, SO_4 fluoride, F bromide, Br

US EPA Method 200.9: Trace Elements by Graphite Furnace Atomic Absorption Spectrometry

arsenic, As

US EPA Method 150.1: pH, Electrometric

SM19, 2320-B: Alkalinity, electrometric titration, mg/L as $CaCO_3$

SM18,2540-C: Total Dissolved Solids Dried at 180°C

US EPA Method 180.1: Turbidity by Nephelometry

Hach Method 8025: Color, Platinum-Cobalt Standard Method

SM18,2340-B: Hardness by Calculation

SM18, 5310B: Non-volatile Organic Carbon

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WATER SAMPLE DATA
LABORATORY SAMPLE NUMBER: 237922

SOURCE: PRIVATE WELL
WELL#:
LOCATION: BARRINGTON HILLS
COUNTY: COOK
TOWNSHIP: 42N
RANGE: 09E
SECTION: 06
PLOT:
TREATMENT:

OWNER: COUNTRYSIDE ELEMENTARY
WELL DEPTH:
DATE COLLECTED: 3/17/2015
DATE RECEIVED: 3/18/2015
FIELD TEMPERATURE (F): ND
COMMENTS: SAMPLE COLLECTED FROM SPIGOT AT WELL TANK. PAGE 3 OF 3.

PARAMETER		RESULT	UNITS
Iron (Total Fe):		1.82	mg/L
Potassium (K):		3.18	mg/L
Calcium (Ca):		82.9	mg/L
Magnesium (Mg):		38.8	mg/L
Sodium (Na):		22.3	mg/L
Aluminum (Al):	<	37	µg/L
Arsenic (As):	<	0.95	µg/L
Barium (Ba):		81.8	µg/L
Beryllium (Be):	<	0.55	µg/L
Boron (B):		32	µg/L
Chromium (Cr):	<	5.8	µg/L
Cobalt (Co):	<	13	µg/L
Copper (Cu):	<	1.6	µg/L
Lithium (Li):	<	110	µg/L
Manganese (Mn):		34.6	µg/L
Molybdenum (Mo):	<	22	µg/L
Nickel (Ni):	<	43	µg/L
Strontium (Sr):		139	µg/L
Tin (Sn):	<	86	µg/L
Titanium (Ti):	<	0.56	µg/L
Vanadium (V):	<	47	µg/L
Zinc (Zn):		24.6	µg/L

PARAMETER		RESULT	UNITS
Fluoride (F):		0.15	mg/L
Chloride (Cl):		62.7	mg/L
Nitrate (NO3-N):	<	0.04	mg/L
Phosphorus (P):	<	0.073	mg/L
Sulfate (SO4):		8.07	mg/L
Sulfur (S):		2.91	mg/L
Bromide (Br)	<	0.08	mg/L
Turbidity (Lab, NTU):		19.9	NTU
Color (PCU):	<	5	PCU
pH (Lab):		7.75	
Alkalinity (CaCO3):		307	mg/L
Hardness (as CaCO3):		367	mg/L
Silica (SiO2):		18.4	mg/L
Total Dissolved Solids:		414	mg/L
Non-Volatile Org. Carbon (Tot., as C):		2.58	mg/L

< = Below detection limit (i.e. < 1.0 = less than 1.0)
mg/L = milligrams per liter
ND = Not determined/Information not available

ug/L = micrograms per Liter
hardness = (Ca mg/L * 2.497) + (Mg mg/L * 4.118)
1 mg/L = 1000 ug/L

Analyzed by: Omar Ali, Rita Bargon, Tanya Grandt, Ruth Ann Nichols, Kaye J Surratt, and Daniel L Webb

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www.isws.illinois.edu

April 20, 2015

Ms. Caitlin Burke
625 Forest Edge Drive
Vernon Hills, IL 60061

Dear Ms. Burke:

We are enclosing a copy of the analysis made on a sample of water collected March 17, 2015, from a well owned by Barrington Hills Park District in Cook County. Relevant sample number is: 237921.

The analysis shows this sample to be moderately mineralized and very hard. The iron content of this water is at a level which can result in the staining of porcelain and laundry. A major portion of the turbidity in this sample appears to be due to the previously soluble iron which oxidized and became insoluble after the water was exposed to air. The hardness in this sample is sufficient to cause the formation of a large amount of scale in hot water heaters, and to increase consumption of soap when used for washing or laundry purposes.

The arsenic content of this sample is below the Federal Maximum Contaminant Level of 10 µg/L. The nitrate (as N) content of this sample is well below the Federal Maximum Contaminant Level of 10 mg/L.

The aesthetic quality of this water would likely be improved with the addition of a sediment filter and water softener to remove iron and hardness.

None of the other parameters tested appear unusual or excessive for Illinois ground water. However, our laboratory is only capable of identifying a limited number of the contaminants found in the Safe Drinking Water Act. Testing for bacteria, radionuclides, and synthetic organic contaminants, if desired, must be arranged through other laboratories. A listing of such laboratories can be found at www.epa.state.il.us/well-water/list-accredited-labs.html or in your yellow pages under "water".

If we can be of further assistance, please let us hear from you.

Sincerely,

Daniel L. Webb

Daniel L. Webb
Lab Supervisor, Chemistry & Technology Section
217/244-0625

jt

cc: BACOG

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The analytical methods used for the samples are as follows:

US EPA 200.7: Metals and Trace Elements by Inductively Coupled Argon Plasma-Atomic Emission Spectrometry:

iron, Fe	sodium, Na	nickel, Ni	beryllium, Be
manganese, Mn	barium, Ba	copper, Cu	potassium, K
calcium, Ca	boron, B	zinc, Zn	cobalt, Co
magnesium, Mg	chromium, Cr	aluminum, Al	lithium, L
molybdenum, Mo	strontium, Sr	tin, Sn	titanium, Ti
vanadium, V	silica, SiO_2	phosphorus, P	sulfur, S

US EPA Method 300.0: Inorganic anions by Ion Chromatography

chloride, Cl nitrate, NO_3-N sulfate, SO_4 fluoride, F bromide, Br

US EPA Method 200.9: Trace Elements by Graphite Furnace Atomic Absorption Spectrometry

arsenic, As

US EPA Method 150.1: pH, Electrometric

SM19, 2320-B: Alkalinity, electrometric titration, mg/L as $CaCO_3$

SM18,2540-C: Total Dissolved Solids Dried at 180°C

US EPA Method 180.1: Turbidity by Nephelometry

Hach Method 8025: Color, Platinum-Cobalt Standard Method

SM18,2340-B: Hardness by Calculation

SM18, 5310B: Non-volatile Organic Carbon

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WATER SAMPLE DATA
LABORATORY SAMPLE NUMBER: 237921

SOURCE: PRIVATE WELL
WELL#:
LOCATION: BARRINGTON HILLS
COUNTY: COOK
TOWNSHIP: 42N
RANGE: 09E
SECTION: 07
PLOT:
TREATMENT:

OWNER: BARRINGTON HILLS PARK DISTRICT
WELL DEPTH:
DATE COLLECTED: 3/17/2015
DATE RECEIVED: 3/18/2015
FIELD TEMPERATURE (F): ND
COMMENTS: SAMPLE COLLECTED FROM HAND PUMP AT WELL HEAD. PAGE 3 OF 3.

PARAMETER		RESULT	UNITS
Iron (Total Fe):		2.22	mg/L
Potassium (K):		2.81	mg/L
Calcium (Ca):		103	mg/L
Magnesium (Mg):		51.9	mg/L
Sodium (Na):		7.57	mg/L
Aluminum (Al):	<	37	µg/L
Arsenic (As):		1.10	µg/L
Barium (Ba):		87.5	µg/L
Beryllium (Be):	<	0.55	µg/L
Boron (B):		23	µg/L
Chromium (Cr):	<	5.8	µg/L
Cobalt (Co):	<	13	µg/L
Copper (Cu):	<	1.6	µg/L
Lithium (Li):	<	110	µg/L
Manganese (Mn):		44.9	µg/L
Molybdenum (Mo):	<	22	µg/L
Nickel (Ni):	<	43	µg/L
Strontium (Sr):		109	µg/L
Tin (Sn):	<	86	µg/L
Titanium (Ti):	<	0.56	µg/L
Vanadium (V):	<	47	µg/L
Zinc (Zn):		35.4	µg/L

PARAMETER		RESULT	UNITS
Fluoride (F):		0.13	mg/L
Chloride (Cl):		17.0	mg/L
Nitrate (NO3-N):	<	0.04	mg/L
Phosphorus (P):	<	0.073	mg/L
Sulfate (SO4):		47.8	mg/L
Sulfur (S):		17.4	mg/L
Bromide (Br)	<	0.08	mg/L
Turbidity (Lab, NTU):		27.9	NTU
Color (PCU):	<	5	PCU
pH (Lab):		7.77	
Alkalinity (CaCO3):		374	mg/L
Hardness (as CaCO3):		471	mg/L
Silica (SiO2):		18.2	mg/L
Total Dissolved Solids:		451	mg/L
Non-Volatile Org. Carbon (Tot., as C):		0.54	mg/L

< = Below detection limit (i.e. < 1.0 = less than 1.0)
mg/L = milligrams per liter
ND = Not determined/Information not available

ug/L = micrograms per Liter
hardness = (Ca mg/L * 2.497) + (Mg mg/L * 4.118)
1 mg/L = 1000 ug/L

Analyzed by: Omar Ali, Rita Bargon, Tanya Grandt, Ruth Ann Nichols, Kaye J Surratt, and Daniel L Webb

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April 20, 2015

Ms. Caitlin Burke
625 Forest Edge Drive
Vernon Hills, IL 60061

Dear Ms. Burke:

We are enclosing a copy of the analysis made on a sample of water collected March 17, 2015, from a 185 foot well owned by Bellarmine Jesuit Retreat House in Cook County. Relevant sample number is: 237920.

The analysis shows this sample to be moderately mineralized and extremely hard. The iron content of this water is at a level which can result in the staining of porcelain and laundry. A major portion of the turbidity in this sample appears to be due to the previously soluble iron which oxidized and became insoluble after the water was exposed to air. The hardness in this sample is sufficient to cause the formation of an exceptionally large amount of scale in hot water heaters, and to increase consumption of soap when used for washing or laundry purposes.

The arsenic content of this sample is well below the Federal Maximum Contaminant Level of 10 µg/L. The nitrate (as N) content of this sample is well below the Federal Maximum Contaminant Level of 10 mg/L.

The water has a high dissolved solids content. This can impart a taste to the water that some individuals may find unpleasant. The aesthetic quality of this water would likely be improved with the addition of a sediment filter and water softener to remove iron and hardness.

None of the other parameters tested appear unusual or excessive for Illinois ground water. However, our laboratory is only capable of identifying a limited number of the contaminants found in the Safe Drinking Water Act. Testing for bacteria, radionuclides, and synthetic organic contaminants, if desired, must be arranged through other laboratories. A listing of such laboratories can be found at www.epa.state.il.us/well-water/list-accredited-labs.html or in your yellow pages under "water".

If we can be of further assistance, please let us hear from you.

Sincerely,

Daniel L. Webb

Daniel L. Webb
Lab Supervisor, Chemistry & Technology Section
217/244-0625

jt

cc: BACOG

The analytical methods used for the samples are as follows:

US EPA 200.7: Metals and Trace Elements by Inductively Coupled Argon Plasma-Atomic Emission Spectrometry:

iron, Fe	sodium, Na	nickel, Ni	beryllium, Be
manganese, Mn	barium, Ba	copper, Cu	potassium, K
calcium, Ca	boron, B	zinc, Zn	cobalt, Co
magnesium, Mg	chromium, Cr	aluminum, Al	lithium, L
molybdenum, Mo	strontium, Sr	tin, Sn	titanium, Ti
vanadium, V	silica, SiO_2	phosphorus, P	sulfur, S

US EPA Method 300.0: Inorganic anions by Ion Chromatography

chloride, Cl nitrate, NO_3-N sulfate, SO_4 fluoride, F bromide, Br

US EPA Method 200.9: Trace Elements by Graphite Furnace Atomic Absorption Spectrometry

arsenic, As

US EPA Method 150.1: pH, Electrometric

SM19, 2320-B: Alkalinity, electrometric titration, mg/L as $CaCO_3$

SM18,2540-C: Total Dissolved Solids Dried at 180°C

US EPA Method 180.1: Turbidity by Nephelometry

Hach Method 8025: Color, Platinum-Cobalt Standard Method

SM18,2340-B: Hardness by Calculation

SM18, 5310B: Non-volatile Organic Carbon

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WATER SAMPLE DATA
LABORATORY SAMPLE NUMBER: 237920

SOURCE: PRIVATE WELL
WELL#:
LOCATION: BARRINGTON HILLS
COUNTY: COOK
TOWNSHIP: 42N
RANGE: 09E
SECTION: 03
PLOT:
TREATMENT:

OWNER: BELLARMINE JESUIT RETREAT HOUSE
WELL DEPTH: 185.00
DATE COLLECTED: 3/17/2015
DATE RECEIVED: 3/18/2015
FIELD TEMPERATURE (F): ND
COMMENTS: SAMPLE COLLECTED FROM BATHROOM SINK COLD WATER TAP. PAGE 3 OF 3.

PARAMETER		RESULT	UNITS
Iron (Total Fe):		3.47	mg/L
Potassium (K):		2.95	mg/L
Calcium (Ca):		116	mg/L
Magnesium (Mg):		66.9	mg/L
Sodium (Na):		14.0	mg/L
Aluminum (Al):	<	37	µg/L
Arsenic (As):	<	0.95	µg/L
Barium (Ba):		90.5	µg/L
Beryllium (Be):	<	0.55	µg/L
Boron (B):		45	µg/L
Chromium (Cr):	<	5.8	µg/L
Cobalt (Co):	<	13	µg/L
Copper (Cu):		3.2	µg/L
Lithium (Li):	<	110	µg/L
Manganese (Mn):		24.2	µg/L
Molybdenum (Mo):	<	22	µg/L
Nickel (Ni):	<	43	µg/L
Strontium (Sr):		315	µg/L
Tin (Sn):	<	86	µg/L
Titanium (Ti):	<	0.56	µg/L
Vanadium (V):	<	47	µg/L
Zinc (Zn):		307	µg/L

PARAMETER		RESULT	UNITS
Fluoride (F):		0.17	mg/L
Chloride (Cl):		41.7	mg/L
Nitrate (NO3-N):	<	0.04	mg/L
Phosphorus (P):	<	0.073	mg/L
Sulfate (SO4):		95.2	mg/L
Sulfur (S):		34.0	mg/L
Bromide (Br)	<	0.08	mg/L
Turbidity (Lab, NTU):		45.1	NTU
Color (PCU):	<	5	PCU
pH (Lab):		7.68	
Alkalinity (CaCO3):		401	mg/L
Hardness (as CaCO3):		565	mg/L
Silica (SiO2):		24.2	mg/L
Total Dissolved Solids:		577	mg/L
Non-Volatile Org. Carbon (Tot., as C):		1.07	mg/L

< = Below detection limit (i.e. < 1.0 = less than 1.0)
mg/L = milligrams per liter
ND = Not determined/Information not available

ug/L = micrograms per Liter
hardness = (Ca mg/L * 2.497) + (Mg mg/L * 4.118)
1 mg/L = 1000 ug/L

Analyzed by: Omar Ali, Rita Bargon, Tanya Grandt, Ruth Ann Nichols, Kaye J Surratt, and Daniel L Webb

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April 20, 2015

Ms. Caitlin Burke
625 Forest Edge Drive
Vernon Hills, IL 60061

Dear Ms. Burke:

We are enclosing a copy of the analysis made on a sample of water collected March 17, 2015, from a 800 foot well owned by Bellarmine Hall in Cook County. Relevant sample number is: 237919.

The analysis shows this sample to be moderately mineralized and hard. The iron and manganese levels are low enough that I would not expect staining due to these elements. The hardness in this sample is sufficient to cause the formation of a moderate amount of scale in hot water heaters, and to increase consumption of soap when used for washing or laundry purposes.

The arsenic content of this sample is well below the Federal Maximum Contaminant Level of 10 µg/L. The nitrate (as N) content of this sample is well below the Federal Maximum Contaminant Level of 10 mg/L.

The barium content of this sample exceeds the federal maximum contaminant level (MCL) of 3 mg/L. Strontium was found at a level of approximately 4.4 mg/L (4400 µg/L). While there is not currently a drinking water standard for strontium, in October 2014 the US EPA made a preliminary determination to regulate it nationwide. The current lifetime health advisory limit is 4 mg/L. Addition of a softener would likely reduce/remove both the barium and the strontium. This will also likely improve the aesthetic quality of the water by removing the iron and hardness.

None of the other parameters tested appear unusual or excessive for Illinois ground water. However, our laboratory is only capable of identifying a limited number of the contaminants found in the Safe Drinking Water Act. Testing for bacteria, radionuclides, and synthetic organic contaminants, if desired, must be arranged through other laboratories. A listing of such laboratories can be found at www.epa.state.il.us/well-water/list-accredited-labs.html or in your yellow pages under "water".

If we can be of further assistance, please let us hear from you.

Sincerely,

Daniel L. Webb

Daniel L. Webb
Lab Supervisor, Chemistry & Technology Section
217/244-0625

jt

cc: BACOG

The analytical methods used for the samples are as follows:

US EPA 200.7: Metals and Trace Elements by Inductively Coupled Argon Plasma-Atomic Emission Spectrometry:

iron, Fe	sodium, Na	nickel, Ni	beryllium, Be
manganese, Mn	barium, Ba	copper, Cu	potassium, K
calcium, Ca	boron, B	zinc, Zn	cobalt, Co
magnesium, Mg	chromium, Cr	aluminum, Al	lithium, L
molybdenum, Mo	strontium, Sr	tin, Sn	titanium, Ti
vanadium, V	silica, SiO_2	phosphorus, P	sulfur, S

US EPA Method 300.0: Inorganic anions by Ion Chromatography

chloride, Cl nitrate, NO_3-N sulfate, SO_4 fluoride, F bromide, Br

US EPA Method 200.9: Trace Elements by Graphite Furnace Atomic Absorption Spectrometry

arsenic, As

US EPA Method 150.1: pH, Electrometric

SM19, 2320-B: Alkalinity, electrometric titration, mg/L as $CaCO_3$

SM18,2540-C: Total Dissolved Solids Dried at 180°C

US EPA Method 180.1: Turbidity by Nephelometry

Hach Method 8025: Color, Platinum-Cobalt Standard Method

SM18,2340-B: Hardness by Calculation

SM18, 5310B: Non-volatile Organic Carbon

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WATER SAMPLE DATA
LABORATORY SAMPLE NUMBER: 237919

SOURCE: PRIVATE WELL
WELL#:
LOCATION: BARRINGTON HILLS
COUNTY: COOK
TOWNSHIP: 42N
RANGE: 09E
SECTION: 03
PLOT: 2F
TREATMENT:

OWNER: BELLARMINE HALL
WELL DEPTH: 800.00
DATE COLLECTED: 3/17/2015
DATE RECEIVED: 3/18/2015
FIELD TEMPERATURE (F): ND
COMMENTS: SAMPLE COLLECTED FROM SPIGOT AT WELL TANK. PAGE 3 OF 3.

PARAMETER		RESULT	UNITS
Iron (Total Fe):		0.082	mg/L
Potassium (K):		11.4	mg/L
Calcium (Ca):		63.6	mg/L
Magnesium (Mg):		22.7	mg/L
Sodium (Na):		28.2	mg/L
Aluminum (Al):	<	37	µg/L
Arsenic (As):	<	0.95	µg/L
Barium (Ba):		5906	µg/L
Beryllium (Be):	<	0.55	µg/L
Boron (B):		200	µg/L
Chromium (Cr):	<	5.8	µg/L
Cobalt (Co):	<	13	µg/L
Copper (Cu):		81.6	µg/L
Lithium (Li):	<	110	µg/L
Manganese (Mn):		4.0	µg/L
Molybdenum (Mo):	<	22	µg/L
Nickel (Ni):	<	43	µg/L
Strontium (Sr):		4431	µg/L
Tin (Sn):	<	86	µg/L
Titanium (Ti):	<	0.56	µg/L
Vanadium (V):	<	47	µg/L
Zinc (Zn):		60.7	µg/L

PARAMETER		RESULT	UNITS
Fluoride (F):		0.74	mg/L
Chloride (Cl):		6.26	mg/L
Nitrate (NO3-N):	<	0.04	mg/L
Phosphorus (P):	<	0.073	mg/L
Sulfate (SO4):		1.12	mg/L
Sulfur (S):		0.46	mg/L
Bromide (Br)	<	0.08	mg/L
Turbidity (Lab, NTU):		0.7	NTU
Color (PCU):	<	5	PCU
pH (Lab):		7.82	
Alkalinity (CaCO3):		306	mg/L
Hardness (as CaCO3):		253	mg/L
Silica (SiO2):		7.65	mg/L
Total Dissolved Solids:		317	mg/L
Non-Volatile Org. Carbon (Tot., as C):		0.53	mg/L

< = Below detection limit (i.e. < 1.0 = less than 1.0)
mg/L = milligrams per liter
ND = Not determined/Information not available

ug/L = micrograms per Liter
hardness = (Ca mg/L * 2.497) + (Mg mg/L * 4.118)
1 mg/L = 1000 ug/L

Analyzed by: Omar Ali, Rita Bargon, Tanya Grandt, Ruth Ann Nichols, Kaye J Surratt, and Daniel L Webb

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April 20, 2015

Ms. Caitlin Burke
625 Forest Edge Drive
Vernon Hills, IL 60061

Dear Ms. Burke:

We are enclosing a copy of the analysis made on a sample of water collected March 17, 2015, from a 277 foot well owned by Barrington United Methodist Church in Cook County. Relevant sample number is: 237916.

The analysis shows this sample to be moderately mineralized and soft, as if it had been passed through a water softener. The iron and manganese levels are low enough that I would not expect staining due to these elements. Because the water is soft, I would not expect scale formation or excessive soap consumption to be a problem.

The arsenic content of this sample is well below the Federal Maximum Contaminant Level of 10 µg/L. The nitrate (as N) content of this sample is well below the Federal Maximum Contaminant Level of 10 mg/L.

None of the other parameters tested appear unusual or excessive for Illinois ground water. However, our laboratory is only capable of identifying a limited number of the contaminants found in the Safe Drinking Water Act. Testing for bacteria, radionuclides, and synthetic organic contaminants, if desired, must be arranged through other laboratories. A listing of such laboratories can be found at www.epa.state.il.us/well-water/list-accredited-labs.html or in your yellow pages under "water".

If we can be of further assistance, please let us hear from you.

Sincerely,

Daniel L. Webb

Daniel L. Webb
Lab Supervisor, Chemistry & Technology Section
217/244-0625

jt

cc: BACOG

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The analytical methods used for the samples are as follows:

US EPA 200.7: Metals and Trace Elements by Inductively Coupled Argon Plasma-Atomic Emission Spectrometry:

iron, Fe	sodium, Na	nickel, Ni	beryllium, Be
manganese, Mn	barium, Ba	copper, Cu	potassium, K
calcium, Ca	boron, B	zinc, Zn	cobalt, Co
magnesium, Mg	chromium, Cr	aluminum, Al	lithium, L
molybdenum, Mo	strontium, Sr	tin, Sn	titanium, Ti
vanadium, V	silica, SiO_2	phosphorus, P	sulfur, S

US EPA Method 300.0: Inorganic anions by Ion Chromatography

chloride, Cl nitrate, NO_3-N sulfate, SO_4 fluoride, F bromide, Br

US EPA Method 200.9: Trace Elements by Graphite Furnace Atomic Absorption Spectrometry

arsenic, As

US EPA Method 150.1: pH, Electrometric

SM19, 2320-B: Alkalinity, electrometric titration, mg/L as $CaCO_3$

SM18,2540-C: Total Dissolved Solids Dried at 180°C

US EPA Method 180.1: Turbidity by Nephelometry

Hach Method 8025: Color, Platinum-Cobalt Standard Method

SM18,2340-B: Hardness by Calculation

SM18, 5310B: Non-volatile Organic Carbon

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WATER SAMPLE DATA
LABORATORY SAMPLE NUMBER: 237916

SOURCE: PRIVATE WELL
WELL#:
LOCATION: BARRINGTON HILLS
COUNTY: COOK
TOWNSHIP: 42N
RANGE: 09E
SECTION: 15
PLOT: 7A
TREATMENT:

OWNER: BARRINGTON UNITED METHODIST CHURCH
WELL DEPTH: 277.00
DATE COLLECTED: 3/17/2015
DATE RECEIVED: 3/18/2015
FIELD TEMPERATURE (F): ND
COMMENTS: SAMPLE COLLECTED FROM KITCHEN SINK COLD WATER TAP. PAGE 3 OF 3.

PARAMETER		RESULT	UNITS
Iron (Total Fe):		0.225	mg/L
Potassium (K):		0.105	mg/L
Calcium (Ca):		0.173	mg/L
Magnesium (Mg):		0.106	mg/L
Sodium (Na):		162	mg/L
Aluminum (Al):	<	37	µg/L
Arsenic (As):	<	0.95	µg/L
Barium (Ba):		1.00	µg/L
Beryllium (Be):	<	0.55	µg/L
Boron (B):		193	µg/L
Chromium (Cr):	<	5.8	µg/L
Cobalt (Co):	<	13	µg/L
Copper (Cu):		21.4	µg/L
Lithium (Li):	<	110	µg/L
Manganese (Mn):		6.3	µg/L
Molybdenum (Mo):	<	22	µg/L
Nickel (Ni):	<	43	µg/L
Strontium (Sr):		4.00	µg/L
Tin (Sn):	<	86	µg/L
Titanium (Ti):	<	0.56	µg/L
Vanadium (V):	<	47	µg/L
Zinc (Zn):		54.5	µg/L

PARAMETER		RESULT	UNITS
Fluoride (F):		0.58	mg/L
Chloride (Cl):		2.51	mg/L
Nitrate (NO3-N):	<	0.04	mg/L
Phosphorus (P):	<	0.073	mg/L
Sulfate (SO4):		2.92	mg/L
Sulfur (S):		1.12	mg/L
Bromide (Br)	<	0.08	mg/L
Turbidity (Lab, NTU):		2.2	NTU
Color (PCU):	<	5	PCU
pH (Lab):		7.97	
Alkalinity (CaCO3):		327	mg/L
Hardness (as CaCO3):		0.87	mg/L
Silica (SiO2):		21.3	mg/L
Total Dissolved Solids:		370	mg/L
Non-Volatile Org. Carbon (Tot., as C):		1.11	mg/L

< = Below detection limit (i.e. < 1.0 = less than 1.0)
mg/L = milligrams per liter
ND = Not determined/Information not available

ug/L = micrograms per Liter
hardness = (Ca mg/L * 2.497) + (Mg mg/L * 4.118)
1 mg/L = 1000 ug/L

Analyzed by: Omar Ali, Rita Bargon, Tanya Grandt, Ruth Ann Nichols, Kaye J Surratt, and Daniel L Webb

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