RESOLUTION E - 2008

DECLARING A PUBLIC HEALTH NUISANCE IN THE AREA OF DORNBUSH SUBDIVISION IN HAMILTON COUNTY, OHIO

The Board of Health of the Hamilton County General Health District met in regular session on the fourteenth day of July 2008 with the following members present:

Mark Rippe, President	yes
Tracey A. Puthoff, Esq., Vice President	yes
Kenneth G. Amend, M.D.	yes
Jim Brett	yes
Thomas A. Chatham	yes

Mr. Chatham moved for adoption of the following resolution:

WHEREAS, a real and present public health problem exists within and around the Dornbush Subdivision in Colerain Township, Ohio, which constitutes that area to be serviced by a sanitary sewer improvement known as the Dornbush Subdivision Sewer Extension Project; and

WHEREAS, the Board of Health of the Hamilton County General Health District has received numerous complaints from citizens living in or around the Dornbush Subdivision regarding odors, health concerns, and water pollution due to malfunctioning household sewage treatment systems; and

WHEREAS, a sanitary survey and extensive water sampling by the Hamilton County General Health District staff has shown that unsafe and disease conditions exist in the storm sewers and drainageways located within and around the Dornbush Subdivision.

NOW, THEREFORE, BE IT RESOLVED, by the Board of Health of the Hamilton County General Health District pursuant to Section 6117.34 and 6117.51of the Ohio Revised Code that the proposed sanitary sewer improvement planned for Dornbush Subdivision in Colerain Township will eliminate existing health hazards and water pollution in the area; and

BE IT FURTHER RESOLVED, that the Board of Health of the Hamilton County General Health District hereby orders the public health nuisance to be abated and declares the area a public health nuisance, pursuant to Ohio Revised Code 307.08 and 6117.39; and

BE IT FURTHER RESOLVED, that the Board of Health finds that the public health nuisance is caused by an occasion of unavoidable urgency and suddenness due to unsanitary conditions; and

BE IT FURTHER RESOLVED, that the Board of Health finds the public health nuisance compels the immediate construction of a sanitary sewer for the protection of the public health and welfare; and

BE IT FURTHER RESOLVED, that this Board of Health requests the Director of the Ohio Environmental Protection Agency to conduct such study as is necessary to concur with the findings of this Board and order the immediate construction of the proposed sanitary sewer improvement; and

BE IT FURTHER RESOLVED, that this Board of Health of the Hamilton County General Health District find and determine that all formal actions relative to the passage of this resolution were taken in an open meeting of this board and that all deliberations of the board and its committees, if any, which resulted in

formal action, were taken in meetings open to the public, in full compliance with the applicable legal requirements, including Section 121.22 of the Ohio Revised Code; and

_____ seconded the Resolution, and upon roll call, the vote was as follows:

Mark Rippe, President	yes
Tracey A. Puthoff, Esq., Vice President	absent
Kenneth G. Amend, M.D.	yes
Jim Brett	yes
Thomas Chatham	yes

Board of Health of the Hamilton County General Health District

_____
Mark Rippe, President

ATTEST: _____ Date: _____
Timothy I. Ingram, Health Commissioner
Secretary to the Board

This resolution was approved as to form by the office of the Hamilton County Prosecuting Attorney, Joseph Deters, Prosecutor.

By: _____ Date: _____
Nee Fong Chin
Chief Assistant Prosecuting Attorney

Dornbusch Subdivision
2008 Sanitary Survey

Hamilton County Public Health
Department of Environmental Health Services
Division of Water Quality

Board of Health
Mark A. Rippe, President
Tracey A. Puthoff, Esq., Vice-President
Kenneth G. Amend, M.D.
Thomas W. Chatham
Jim Brett

Timothy Ingram, Health Commissioner

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Dornbusch Subdivision Sanitary Survey

BACKGROUND:

Hamilton County Public Health (HCPH) actively pursues efforts to prevent disease and remove water pollution sources in Hamilton County streams and watersheds. Introduction of pollutants into a watershed can cause significant harm by reducing aquatic life, lowering aesthetic quality, and increasing the risk of human exposure to hazardous substances or disease-causing pathogens. Improperly operating household sewage treatment systems (HSTS) and semi-public sewage treatment systems (SPSTS) can be a substantial contributing factor in the degradation of water quality.

Beginning in August of 2007, and concluding in May of 2008, the staff of the Water Quality Division conducted a sanitary survey of the Dornbusch Subdivision. The survey area is located in Colerain Township, Hamilton County, Ohio (See Figure 1). This survey was conducted in response to nuisance complaints and visual inspections on Susanna Drive, Sagebrush Lane, Yellowstone Drive and Flattop Drive.

In order to create this sanitary survey report, the Health District staff reviewed the operating history of all household and semi-public sewage treatment systems within the area, conducted onsite inspections of these sewage treatment systems (STS), investigated storm sewer drainage, visited waterways in the neighborhood and collected water samples throughout the survey area. The result of the inspections and subsequent sample data indicate there is a public health risk due to malfunctioning STS and/or inadequately treated effluent from these STS which are entering neighborhood creeks, storm sewers, and drainage ways within the survey area.

PURPOSE:

The purpose of this sanitary survey is to determine the impact from all STS in the survey area and to qualify the degree of risk which these STS may create on both human health and aquatic life. Additionally, information gathered during the survey was used to determine the feasibility of installing new onsite STS which can meet today's water quality standards and regulations.

DESCRIPTION OF WATERSHED:

The Dornbusch Subdivision is in the New Baltimore Watershed. All surface waters in the survey area, including discharge from STS, run into collector lines, storm sewers, drainage ways, or streams. Eventually, all of the area's surface waters and STS effluent flows into Taylor Creek. The soil series in the area consists of Rossmoyne Urban land complex and Avonburg Urban land complex. There are one hundred-fourteen (114) homes located within the survey area which encompasses approximately 58 acres. The average lot size is one-half (1/2) of an acre.

METHODOLOGY:

In response to nuisance complaints and visual inspections of the drainage ways, storm sewers, and creeks during routine inspections, the HCPH initiated a detailed sanitary survey of this watershed. Described below are the steps taken to implement this survey.

1. Conduct a survey inspection of STS within the watershed area. A survey inspection is a systematic exercise involving a thorough "walk through" of the properties to identify all potential pollution sources. All STS found to be malfunctioning or in question, are further evaluated by dye testing and/or collecting samples of the effluent from the discharge points and associated surface waters.

2. Review previously conducted household sewage treatment system inspection reports for compliance history.

3. Review all nuisance complaints on record to develop a perspective on historical problems in the watershed area. A nuisance complaint inspection involves a Health District sanitarian visiting the site, interviewing involved parties, performing investigations, and possibly collecting effluent samples to determine the validity of an alleged nuisance. Typically, a complaint is filed by a concerned resident via the telephone.

4. Review communicable disease reports to determine if there are any reported waterborne diseases in the watershed area in which the sanitary survey was conducted.

5. Collect water samples at selected sites throughout the watershed. Samples are tested for fecal coliform bacteria, five day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and ammonia (NH_3). Test results are compared to water quality standards set by the Ohio Environmental Protection Agency (OEPA) which can be found in Ohio Administrative Code 3745-1, Table 5-1 and Hamilton County Sewage Code Regulation 529.

FINDINGS:

There are seventy-three (73) aerobic treatment units (ATU's) in the survey area. ATU's are mechanical-type household sewage treatment systems. This type of sewage treatment system utilizes an electric motor which pumps or draws ambient air into the wastewater. The aerobic (oxygen rich) environment sustains oxygen breathing bacteria that treat the organic constituents and harmful bacteria found in wastewater. This treated wastewater is then discharged into the environment.

The aerobic treatment units located within the survey area have failed to meet the operational and maintenance criteria, set forth in HCPH Sewage Regulation 529, 18% of the time. Even when these ATU's are meeting operational criteria, they do not routinely meet today's effluent quality standards.

Of the seventy-three (73) ATU's in the survey area, thirty-six (36) are of the Cavitette brand of which none have an upflow filter. Upflow filters are used as a tertiary treatment device to further treat the organics found in residential wastewater by filtering out suspended solids. Twenty (20) of the twenty-three (23) Jet brand ATU's in the survey area do not have an upflow filter. Other ATU's found in the survey area include three (3) Oldham units with upflow filters, three (3) Coate Aer units with upflow filters, three (3) Multi-flo units and five (5) Nayadic units. Neither the Nayadic nor the Multi-flo units have upflow filters.

There are twenty-one (21) subsurface sand filters (SSSF) within the survey area. A subsurface sand filter is a type of non-mechanical STS that utilizes sand as the treatment media. Aerobic bacteria adhere to the sand grains and digest the organics in the wastewater as it passes through the sand. Harmful bacteria and viruses are filtered by the sand media and are further metabolized by the aerobic bacteria. A collector pipe at the bottom of the filter bed allows the treated wastewater to discharge effluent to the environment. One sand filter was found to be malfunctioning during this survey.

There are fifteen (15) leach line systems within the survey area (See Table 1). A leach line system is a non-mechanical type STS which utilizes the in-situ soil at the site as the treatment media to treat and absorb the wastewater. The aerobic bacteria adhere to the soil and digest the organics in the wastewater as it flows through the soil. Harmful bacteria and viruses are filtered by the soil media and are further metabolized by the aerobic bacteria. Leach line systems are designed to allow no discharge to surface waters. All of the leach line systems were found to be operating properly during this survey.

The home size in the survey area ranges from two to four bedrooms and the estimated flow rate per bedroom is 120 gallons per day (GPD). Therefore, it is estimated that the daily effluent discharging from STS within the survey area is 23,760 – 47,520 GPD.

There have been twelve (12) citizen complaints filed within the survey area since 2001. Nine (9) of the twelve (12) complaints were found to be valid. Eight (8) of the twelve (12) complaints were caused by malfunctioning ATU's. There have been no reported cases of communicable disease in the survey area.

In April 1996, a public meeting was held between the Health District, MSD, and the Dornbush Subdivision residents. The purpose of this meeting was to discuss findings of collector line effluent and stream sample lab results and the need for sanitary sewers to be extended into the survey area. A favorable sanitary sewer petition was submitted to MSD in July 1996 following the public meeting. Once MSD had designed the sewer, polling packets were mailed to the area residents showing the sewer cost at $17,182 per benefited property. By August 2001, the official polling showed that 34 benefits were for the project, 80 were against the project, and 27 did not vote. Based on this information, MSD and the Board of County Commissioners closed the project. In July 2003, a truncated sewer project was approved by a small portion of area residents. That project includes 24 properties along Springdale Road and is scheduled for construction beginning

in 2009. Based on the current MSD's Rules and Regulations, the per benefit sewer extension cost for the remaining properties in the survey area will not exceed $12,000.

Table 1: Inventory of Area Sewage Treatment Systems

System Type: Discharging (Mechanical)	**Number**
Cavitette ATU	36
Coate Aer ATU	3
Oldham ATU with Upflow Filter	3
Jet ATU	20
Jet ATU with Upflow Filter	3
Multi-flo ATU	3
Nayadic ATU	5
System type: Discharging (Non-Mechanical)	**Number**
Subsurface Sandfilter	21
System type: Non-Discharging (Non-Mechanical)	**Number**
Leach Lines	15
Inconclusive	5
Total systems in Survey Area	*114*

There are ten (10) collector lines (CL) within the survey area. A collector line is a private sewer pipe which collects and discharges sewage treatment system effluent from properties that do not have an acceptable and defined drainage feature on the property where the effluent is generated. Five of the ten collector lines in the survey area are also used as storm sewers. Table 2 gives a detailed description of the collector line inventory, including the number of homes connected to a collector line, the figure (photo) number of each collector line, and whether the collector line is combined with a storm sewer.

The ten (10) collector lines within this survey area serve fifty-seven (57) homes (See Table 2). These collector lines discharge to creeks and drainage ways within the survey area. Figures 2 - 9 show the photos of the points of discharge of collector lines 1 - 8. Collector lines 1, 5, 6, 7 and 8 are also used as storm sewers. Collector lines 2, 3, 4, 9 and 10 only carry sewage effluent. Pictures and samples were unable to be taken from the outfalls of collector lines 9 and 10. Both of these collector lines discharge outside of the survey area.

Table 2: Inventory of Area Collector Lines

Collector Line ID	**# of Homes Connected**	**Figure #**	**Type**
CL 1	12	2	Combined
CL 2	3	3	Collector
CL 3	3	4	Collector
CL 4	10	5	Collector
CL 5	3	6	Combined
CL 6	10	7	Combined
CL 7	2	8	Combined
CL 8	14	9	Combined
Total	**57**		

Figure 1: Map of the Survey Area with Sample Locations

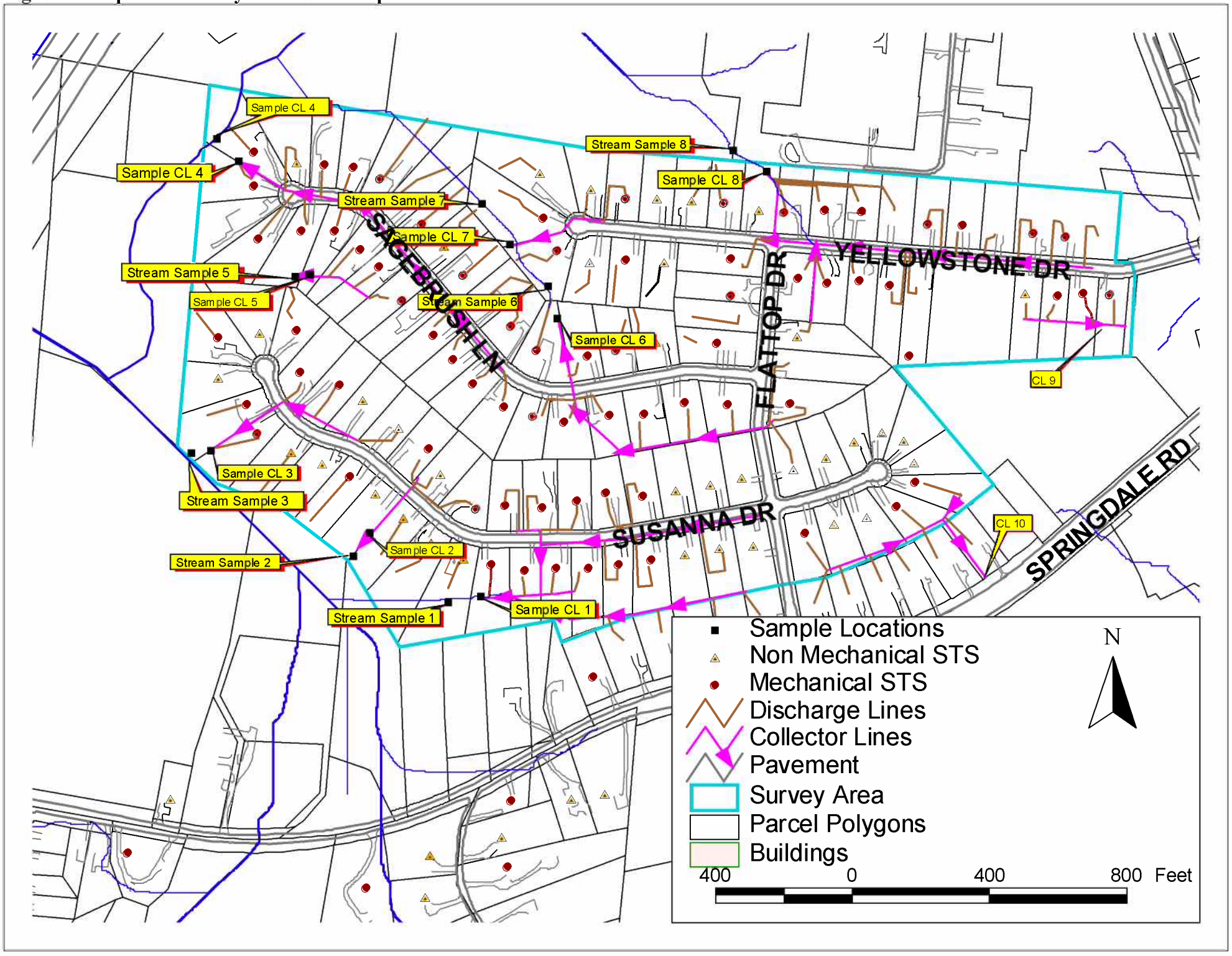

Figure 2: Collector Line 1 (CL1)

Figure 3: Collector Line 2 (CL2)

Figure 4: Collector Line 3 (CL3)

Figure 5: Collector Line 4 (CL4)

Figure 6: Collector Line 5 (CL5)

Figure 7: Collector Line 6 (CL6)

Figure 8: Collector Line 7 (CL7)

Figure 9: Collector Line 8 (CL8)

Water samples were collected from the collector lines and streams within the survey area (See Figure 1). The samples were collected at the collector line outfall and approximately 50-100 feet downstream from the collector line. There were a total of eighty-eight (88) grab samples collected and analyzed between August 14, 2007 and May 19, 2008. These samples were analyzed for Fecal Coliform, five day Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), and Ammonia (NH_3) (See Tables 3 & 4).

Sixty-nine percent (69%) of the collector line samples and seventy percent (70%) of the stream samples collected were above the requirements found in HCPH Regulation 529 and the Ohio Environmental Protection Agency (OEPA) secondary contact water standard of 5,000 fecal colonies per 100 ml. Fecal coliform are bacteria found in the intestines of warm-blooded animals. The presence of fecal coliform bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of man or other animals. At the time this occurred, the source water may have been contaminated by pathogens or other disease causing organisms, which may also exist in fecal material. Fecal coliform bacteria are an indicator that a potential health risk exists for individuals exposed to this water.

Fifty-eight percent (58%) of the collector line samples and twenty-four (24%) of the stream samples collected were above the HCPH Regulation 529 standard level of 20 mg/l for BOD_5. The BOD_5 test is an indicator of waste strength which measures the amount of oxygen consumed by the bacteria as they decompose organic matter. Higher oxygen demand has a direct relationship with higher waste strengths. When biodegradable organic matter is discharged to surface waters aerobic bacteria will consume much of the dissolved oxygen, robbing other aquatic organisms of the oxygen they need to survive. Once all of the oxygen is removed, anaerobic bacteria take over producing sewage odors, blackish slimes, and fungal growth.

Twenty-two percent (22%) of the collector line samples and forty-one (41%) of the stream samples collected were above the HCPH Regulation 529 standard level of 40 mg/L for TSS. The TSS test measures the amount of solids physically suspended and

dissolved in a water sample. These solids are either organic or inorganic and can result in higher waste strengths. Suspended solids exiting a treatment system will interfere with any disinfection device by allowing pathogenic bacteria or viruses to be shielded from the chemical, physical, or biological disinfection agent. Additionally, suspended solids discharged to surface waters can lead to siltation of waterways or block light transfer slowing the natural process of photosynthesis within the aquatic environment.

Ninety-three percent (93%) of the collector line samples and ninety-two percent (92%) of the stream samples collected were above the Ohio EPA's summer standard for ammonia of 1 mg/L. Ammonia is an intermediate product when organic compounds are partly broken down. In complete treatment of sewage, ammonia is oxidized or nitrified to produce nitrate as an end product within the sewage treatment system. If discharged prior to complete nitrification, ammonia will be converted to nitrate by bacteria found in the receiving stream. This process can use up any dissolved oxygen in the receiving environment thus robbing other aquatic organisms of the oxygen they need to survive. Once all of the oxygen is removed, anaerobic bacteria take over producing sewage odors, blackish slimes, and fungal growth. Additionally, ammonia concentrations exceeding the standard can be a lethal toxin to aquatic organisms.

The review of the land parcels within the survey area to determine the feasibility of installing new onsite sewage treatment systems resulted in an overwhelming number of cases that would require a discharging type sewage treatment system. This was mainly due to the size of the lots, topography, soil types, and the fact that most of the land area of many of these parcels has been utilized for structures such as, but not limited to, garages, driveways, patios, decks and swimming pools.

Table 3: Sample Results for Collector Lines

Sample Location	Sample Date	Fecal Coliform) (colonies/100mL)	5-Day BOD (mg/L)	TSS (mg/L)	Ammonia (mg/L)
CL1	08/14/2007	20,000*	14	11	13.5*
	08/15/2007	>6,670*	24.5*	24	2.58*
	08/21/2007	48,000*	8.0	16.0	3.98*
	08/21/2007	25,000*	12.5	12	6.62*
	08/16/2007	1,030	31*	15	17.4*
	05/19/2008	1,850	-	11	4.59*
CL2	08/15/2007	>20,000*	22*	26	3.4*
	08/16/2007	20	n/a	n/a	n/a
	08/21/2007	111,000*	20.5*	9	1.12*
	08/21/2007	2,300	17.5	7	0.655
	05/19/2008	2,200	-	4	.798
CL3	08/14/2007	197,000*	25.5*	48*	14.7*
	08/15/2007	>20,000*	28.5*	22	14.6*
	08/16/2007	171	22*	6	5.66*
	08/21/2007	1,010,000*	86.5*	124*	19*
	08/21/2007	63,100*	73.5*	47*	8.24*
	05/19/2008	4,100	-	40	12.9*
CL4	08/14/2007	20,000*	28*	44.5*	18.8*
	08/15/2007	>6,670*	16.0	29.0	15.6*
	08/16/2007	2,800	17.0	25.0	13.1*
	08/20/2007	380,000*	34*	31.0	8.84*
	05/19/2008	5,500*	-	9	3.18*
CL5	08/14/2007	6,670*	19	<5.0	9.25*
	08/15/2007	>6,670*	19	35.5	9.22*
	08/16/2007	136	29*	40.0	4.55*
	05/19/2008	6,800*	-	3	2.43*
CL6	08/14/2007	25,000*	43*	18	8.53*
	08/15/2007	>20,000*	36*	25	7.7*
	08/16/2007	71	77.5*	10	6.43*
	08/20/2007	32,000*	15	45.5*	6.35*
	08/20/2007	24,300*	28*	80*	9.18*
	05/19/2008	43,000*	-	34	6.79*
CL7	08/14/2007	450	48.5*	45*	43.1*
	08/15/2007	>6,670*	13	22	23.1*
	08/16/2007	280	43.5*	34	18.1*
	08/20/2007	32,000*	15.0	45.5*	6.35*
	08/20/2007	180,000*	116*	43*	46.1*
	05/19/2008	26,000*	-	5	11.6*
CL8	08/14/2007	585	21*	76.5*	12.5*
	08/15/2007	>20,000*	16.5	31	29.1*
	08/16/2007	230	31.5*	11	19.2*
	08/21/2007	510,000*	99.5*	12	2.9*
	08/21/2007	430,000*	19.5	17	8.51*
	05/19/2008	7,900*	-	16	1.05*

* Exceeds the effluent quality standards - Indicates Lab Error

Table 4: Sample Results for Drainage Ways

Sample Location	Sample Date	Fecal Coliform (colonies/100mL)	5-Day BOD (mg/L)	TSS (mg/L)	Ammonia (mg/L)
Stream Sample 1	08/14/2007	15,600*	18	5	12.9*
	08/15/2007	>6,670*	9	49*	12*
	08/16/2007	15	27*	33	12*
	08/21/2007	27,000*	9	12.5	5.17*
	08/21/2007	480,008*	8	16	3.98*
	05/19/2008	13,636*	-	8	2.82*
Stream Sample 2	08/21/2007	44,000*	<4	17	0.556
	08/21/2007	13,100*	<4	11	0.519
	05/19/2008	341	N/A	N/A	N/A
Stream Sample 3	08/14/2007	480	4	<5	1.94*
	08/15/2007	>6,670*	9	18	3.89*
	08/16/2007	60	<4	36	1.07*
	08/21/2007	26,000*	9	20	3.37*
	08/21/2007	7,700*	7	7.5	2.67*
	05/19/2008	29,000*	-	9	.54
Stream Sample 4	08/14/2007	20,000*	N/A	N/A	N/A
	08/15/2007	>6,670*	N/A	N/A	N/A
	08/16/2007	179	17	54.5*	14.3*
	08/20/2007	153,000*	32.0*	118*	5.69*
	08/20/2007	40,000*	27*	87*	4.50*
	08/20/2007	980,000*	33*	32.5	8.83*
	05/19/2008	100,000*	-	14	2.55*
Stream Sample 5	08/14/2007	20,000*	N/A	N/A	N/A
	08/15/2007	>6,670*	N/A	N/A	N/A
	08/16/2007	179	17.0	54.5*	14.3*
	05/19/2008	2,600	-	82*	2.66*
Stream Sample 6	08/14/2007	20,000*	7	72.5*	6.92*
	08/15/2007	>20,000*	18	43.5*	7.91*
	08/16/2007	210	14	15	11.2*
	08/20/2007	61,400*	68*	27.5	7.84*
	08/20/2007	158,000*	49*	53.5*	27.5*
	05/19/2008	2,900	-	26	4.90*
Stream Sample 7	08/14/2007	7,600*	17	<5	4.46*
	08/15/2007	>6,670*	9	48.5*	4.43*
	08/16/2007	20	8	16	2.43*
	08/20/2007	9,290*	13	15.5	3.8*
	08/20/2007	58,000*	18	14.5	7.19*
	05/19/2008	1,433	-	3	3.95*
Stream Sample 8	08/14/2007	585	21*	76.5*	12.5*
	08/15/2007	>20,000*	9	38.5	17.4*
	08/16/2007	10	29*	209*	17.9*
	08/20/2007	33,000*	7.00	45*	18.2*
	08/21/2007	2,000,000*	13	72.5*	3.12*
	08/21/2007	1,160,000*	14	116*	6.78*
	05/19/2008	4,500	N/A	N/A	N/A

*Exceeds the effluent quality standards - Indicates Lab Error

CONCLUSIONS:

The majority of the household sewage treatment systems in the survey area were installed between 1957 & 1987. Eight (8) permitted replacement systems have been installed since the original installations. The current systems in use cannot consistently meet today's water quality standards. Furthermore, the soil types in the area, Rossmoyne Urban land complex and Avonburg Urban land complex are rated as "poor" for septic tank absorption fields by the United States Department of Agriculture Soil Conservation Service.

Due to the soil types, topography, and limited installation area, new soil absorption sewage treatment systems would not be an option for a majority of the parcels. If replacement systems were installed, most of the properties would need to discharge into the existing collector lines found throughout the survey area. Due to the fact that all of these collector lines are either combined with or discharge to area storm sewers, the United States Environmental Protection Agency (USEPA) Phase II Stormwater Regulations require the elimination of these illicit discharges.

A potential for waterborne disease will exist when STS are not maintained properly or if they cannot consistently produce effluent which meets today's water quality standards. The Water Quality Division Staff, through routine operation permit inspections and nuisance complaint investigations, help to ensure that all sewage treatment systems are operating in a manner consistent with the HCPH Regulation 529. Due to the poor effluent quality within the survey area and the potential health risks associated with this effluent, a public health nuisance exists within the Dornbush Subdivision that must be addressed.

RECOMMENDATIONS:

Based on the findings of this sanitary survey and the requirements of the USEPA Phase II Storm Water Regulations, the staff of the Water Quality Division recommends the construction of a sanitary sewer system for the survey area.