MONROE COUNTY

WATER QUALITY STUDY 2006

Volume II of II – Technical Appendices

MONROE COUNTY PLANNING COMMISSION
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STREAM SAMPLING STATIONS

The following information has been included to facilitate the use of the appendices.

Site Number	Site Id	Date Time Sampled	Description
01	PARACR03	8/7/06 0830	**PARADISE CREEK** (Pocono) Approximately 150 yards upstream of the railroad bridge on Route 191. Lat. 41° 04' 19.60" Long. -75° 13' 36.40"
02	BUTZRU01	8/7/06 0915	**BUTZ RUN** (Paradise) Approximately 50 yards upstream of its confluence with Paradise Creek. Lat. 41° 04' 41.20" Long. -75° 13' 44.50"
03	CRCRPA01	8/7/06 1000	**CRANBERRY CREEK** (Paradise) Approximately 75 yards upstream of Browns Hill Road. Lat. 41° 06' 03.80" Long. -75° 14' 58.60"
04	DEHOCR04	8/7/06 1030	**DEVILS HOLE CREEK** (Paradise) Approximately 15 yards upstream of its confluence with Paradise Creek. Lat. 41° 07' 54.00" Long. -75° 18' 50.00"
05	PARACR04	8/7/06 1115	**PARADISE CREEK** (Paradise) Approximately 50 yards downstream of confluence of Tank Creek and Yankee Run. Lat. 41° 07' 43.80" Long. -75° 18' 57.80"
06	INDIRU01	8/7/06 1200	**INDIAN RUN** (Pocono) Immediately upstream of Fairview Ave. Lat. 41° 06' 20.88" Long. -75° 22' 27.05"
07	FOHIRU01	8/8/06 0830	**FOREST HILLS RUN** (Paradise) Approximately 25 yards upstream of Lower Swiftwater Road. Lat. 41° 06' 03.10" Long. -75° 16' 20.40"

Site Number	Site ID	Date Time Sampled	Description
08	SWIFCR06	8/8/06 0845	**SWIFTWATER CREEK** (Pocono) Approximately 20 yards upstream of its confluence with Forest Hills Run. Lat. 41° 06' 06.80" Long. -75° 16' 18.80"
09	SWIFCR02	8/8/06 0915	**SWIFTWATER CREEK** (Pocono) Approximately 25 yards downstream of its confluence with Forest Hills Run. Lat. 41° 06' 03.70" Long. -75° 16' 16.70"
10	PARACR01	8/8/06 1000	**PARADISE CREEK** (Paradise) Approximately 50 yards upstream of Lower Swiftwater Road. Lat. 41° 06' 07.30" Long. -75° 16' 07.60"
11	FOHIRU09	8/8/06 1030	**FOREST HILLS RUN** (Paradise) Approximately 25 yards downstream of Carlton Road. Lat. 41° 06' 51.00" Long. -75° 18' 42.30"
12	FOHIRU06	8/8/06 1100	**FOREST HILLS RUN** (Paradise) Approximately 75 yards upstream of stream crossing at Mt Airy Lodge parking lot. Lat. 41° 06' 46.00" Long. -75° 19' 34.90"
13	LEHIRI01	8/09/06 0830	**LEHIGH RIVER** (Tobyhanna) Above STP in Thornhurst. Lat. 41° 10' 33.26" Long. -75° 35' 01.47"
14	LEHIRI02	8/09/06 0915	**LEHIGH RIVER** (Tobyhanna) Below STP in Thornhurst. Lat. 41° 10' 20.99" Long. -75° 35' 19.56"

Site Number	Site ID	Date Time Sampled	Description
15	TOBYCR01	8/09/06 1030	**TOBYHANNA CREEK** (Coolbaugh) Approximately 75 yards downstream of S.R 423 bridge at east boundary of Warnertown and State Game Lands 127. Lat. 41° 09' 43.80" Long. -75° 27' 21.90"
16	SWIFCR07	8/09/06 1100	**SWIFTWATER CREEK** (Pocono) Approximately 75 yards upstream of Route 314. Lat. 41° 06' 02.00" Long. -75° 20' 51.30"
17	SWIFCR05	8/09/06 1200	**SWIFTWATER CREEK** (Pocono) Approximately 200 yards downstream of sanofi pasteur property. Lat. 41° 05' 41.00" Long. -75° 18' 34.10"
18	SWIFCR03	8/09/06 1230	**SWIFTWATER CREEK** (Pocono) Immediately downstream of old bridge at the Swiftwater Inn (Route 611). Lat. 41° 05' 39.90" Long. -75° 19' 41.70"
19	CRCRPA03	8/10/06 0815	**CRANBERRY CREEK** (Barrett) Approximately 200 yards downstream of Bestway discharge. Lat. 41° 08' 51.30" Long. -75° 17' 01.50"
20	DRSARU01	8/10/06 0830	**DRY SAWMILL RUN** (Pocono) Approximately ½ mile south of Sullivan Trail at its intersection with Brookdale Road. Lat. 41° 04' 14.10" Long. -75° 22' 11.80"
21	POCOCR20	8/10/06 0920	**POCONO CREEK** (Pocono) Approximately 15 yards downstream of its confluence with Wolf Swamp Run. Lat. 41° 03' 35.10" Long. -75° 22' 02.20"

Site Number	Site ID	Date Time Sampled	Description
22	POCOCR16	8/10/06 0945	**POCONO CREEK** (Pocono) Approximately 200 yards south of Mountain View Village, approximately 10 yards downstream of its confluence with Coolmoor Creek. Lat. 41° 03' 06.10" Long. -75° 20' 19.00"
23	POCOCR17	8/10/06 1030	**POCONO CREEK** (Pocono) Approximately 50 yards downstream of Sullivan Trail. Lat. 41° 03' 02.70" Long. -75° 19' 15.80"
24	POCOCR19	8/10/06 1130	**POCONO CREEK** (Pocono) At the Crossings Factory Stores overflow parking area. Lat. 41° '03 00.80" Long. -75° 18' 49.70"
25	SCOTCR04	8/11/06 0800	**SCOTRUN CREEK** (Pocono) Approximately 100 yards upstream of bridge at the Crossings Factory Stores overflow parking area. Lat. 41° 04' 05.30" Long. -75° 19' 10.20"
26	POCOCR15	8/11/06 0845	**POCONO CREEK** (Pocono) Approximately 25 yards upstream of the bridge on Rim Rock Drive. Lat. 41° 00' 11.90" Long. -75° 16' 47.40"
27	POCOCR18	8/11/06 0900	**POCONO CREEK** (Stroud) Approximately 50 yards downstream of Shafers School House Road. Lat. 40° 59' 27.60" Long. -75° 15' 19.10"
28	POCOCR22	8/11/06 1000	**POCONO CREEK** (Stroud) Approximately 1 mile downstream of Shafers School House Road at Kirkwood Camp. Lat. 40° 59' 03.32" Long. -75° 14' 59.45"

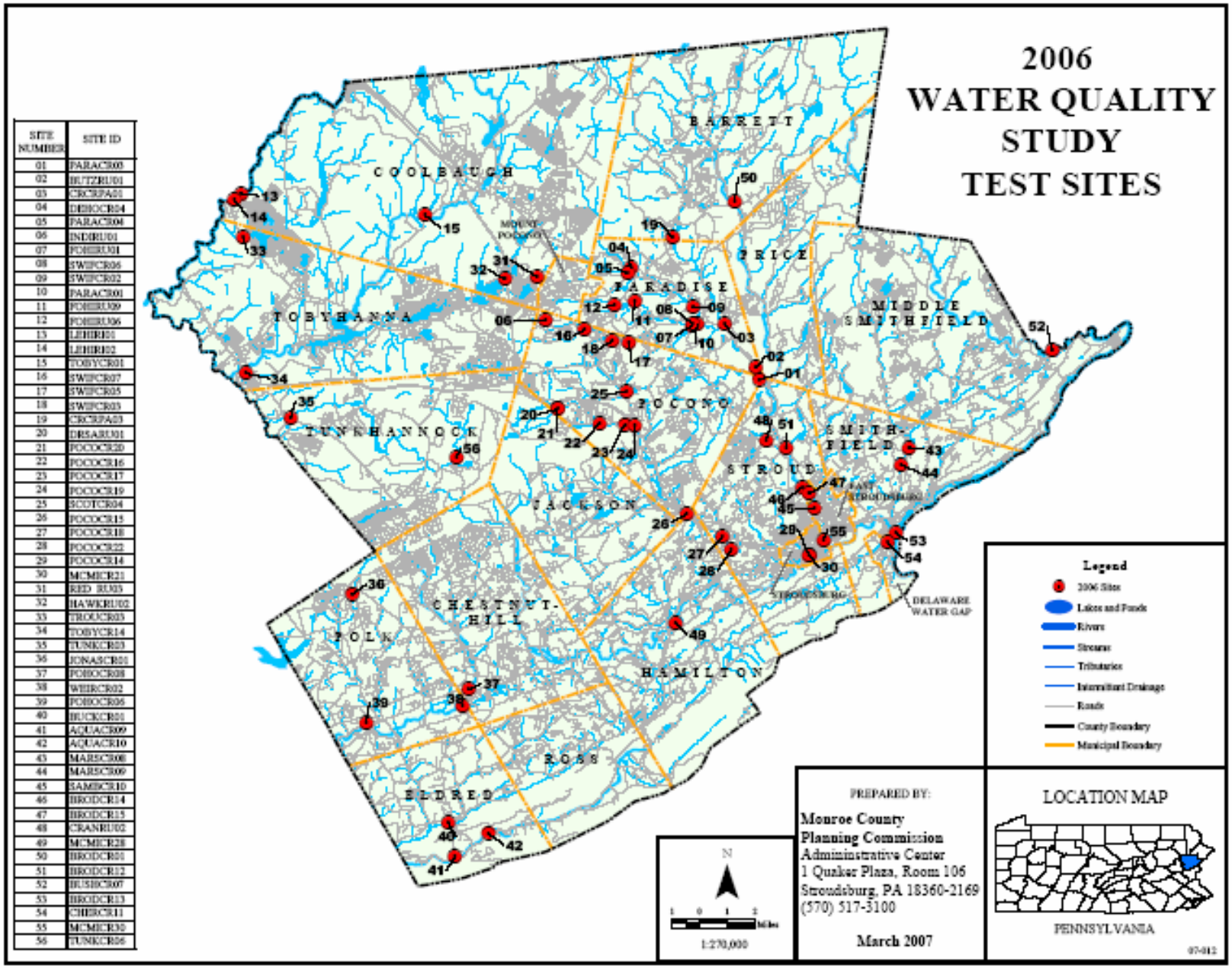
Site Number	Site ID	Date Time Sampled	Description
29	POCOCR14	8/11/06 1045	**POCONO CREEK** (Stroudsburg) Approximately 50 yards upstream of its confluence with McMichael Creek. Lat. 40° 58' 49.40" Long. -75° 11' 44.70"
30	MCMICR21	8/11/06 1115	**MCMICHAEL CREEK** (Stroudsburg) Approximately 30 yards downstream of its confluence with Pocono Creek. Lat. 40° 58' 48.80" Long. -75° 11' 42.70"
31	REDRU03	8/14/06 0800	**RED RUN** (Coolbaugh) Approximately 100 yards upstream of Industrial Park Drive. Lat. 41° 07' 44.61" Long. -75° 22' 41.84"
32	HAWKRU02	8/14/06 0845	**HAWKEY RUN** (Coolbaugh) Approximately 250 yards west of Rte. 380 & 100 yards NE of Stillwater Lake. Lat. 41° 07' 39.52" Long. - 75° 24' 06.01"
33	TROUTCR03	8/14/06 0930	**TROUT CREEK** (Tobyhanna) Approximately ½ mile downstream of Arrowhead Lake Dam. Lat. 41° 09' 11.15" Long. -75° 34' 59.09"
34	TOBYCR14	8/14/06 1030	**TOBYHANNA CREEK** (Tobyhanna) Immediately upstream of the Route 115 bridge, downstream of the STP. Lat. 41° 04' 57.61" Long. -75° 35' 00.85"
35	TUNKCR03	8/14/06 1100	**TUNKHANNOCK CREEK** (Tunkhannock) Approximately 100 yards upstream of Route 115 bridge near its intersection with Route 903. Lat. 41° 03' 32.90" Long. -75° 33' 11.00"

Site Number	Site ID	Date Time Sampled	Description
36	JONASCR01	8/14/06 1130	**JONAS CREEK** (Polk) South of Dotters Corner Rd. immediately upstream of bridge. Lat. 40° 58' 01.16" Long. -75° 30' 48.20"
37	POHOCR08	8/15/06 0830	**POHOPOCO CREEK** (Chestnuthill) Upstream of 209 bridge at Beechwood Inn. Lat. 40° 54' 56.74" Long -75° 26' 09.29"
38	WEIRCR02	8/15/06 0845	**WEIR CREEK** (Polk) Approximately 25 yards upstream of County Park Rd. Lat. 40° 54' 27.00" Long. -75° 26' 20.98"
39	POHOCR06	8/15/06 0930	**POHOPOCO CREEK** (Polk) At Berger Drive (where stream bends to the west near the road) at the County line. Lat. 40° 53' 58.80" Long. -75° 30' 22.20"
40	BUCKCR01	8/15/06 1100	**BUCKWHA CREEK** (Eldred) Approximately 200 yards downstream of stone bridge in Kunkletown. Lat. 40° 50' 50.15" Long. -75° 27' 03.63"
41	AQUACR09	8/15/06 1145	**AQUASHICOLA CREEK** (Eldred) Approximately 100 yards upstream of the bridge on Mountain Road, near County border. Lat. 40° 49' 45.70" Long. -75° 26' 49.30"
42	AQUACR10	8/15/06 1230	**AQUASHICOLA CREEK** (Eldred) At the Kunkletown Rod and Gun Club, immediately downstream of bridge on the private drive. Lat. 40° 50' 28.58" Long. -75° 25' 24.34"

Site Number	Site ID	Date Time Sampled	Description
43	MARSCR08	8/16/06 0815	**MARSHALLS CREEK** (Smithfield) Approximately 50 yards upstream of bridge on Route 209. Lat. 41° 02' 04.90" Long. -75° 07' 27.00"
44	MARSCR09	8/16/06 0830	**MARSHALLS CREEK** (Smithfield) Approximately 25 yards upstream of bridge on County Bridge Road. Lat. 41° 01' 33.60" Long. -75° 07' 47.80"
45	SAMBCR10	8/16/06 0905	**SAMBO CREEK** (East Stroudsburg) Approximately 100 yards upstream of the mouth. Lat. 41° 00' 17.75" Long. -75° 11' 27.43"
46	BRODCR14	8/16/06 0930	**BRODHEAD CREEK** (Stroud) Immediately downstream of bridge at intersection of Stokes Mill Rd and Stoke Ave. Lat. 41° 0' 56.91" Long. -75° 11' 56.08"
47	BRODCR15	8/16/06 1015	**BRODHEAD CREEK** (Stroud) Directly behind Moose Lodge (site chosen for proposed STP discharge). Lat. 41° 00' 43.25" Long. -75° 11' 40.26"
48	CRANCR01	8/16/06 1030	**CRANBERRY CREEK** (Stroud) Hallet Road below Penn Estates @ bridge on Griffen Property. Lat. 41° 02' 25.30" Long. -75° 13' 23.38"
49	MCMICR28	8/16/06 1145	**MCMICHAEL CREEK** (Hamilton) Adjacent to County soccer fields, upstream of Appenzell Creek. Lat. 40° 56' 50.10" Long. -75° 17' 23.80"

Site Number	Site ID	Date Time Sampled	Description
50	BRODCR01	8/17/06 0830	**BRODHEAD CREEK** (Barrett) Approximately 50 yards upstream of Brinker's Bridge, at the intersection of Route 447 and Mill Creek Road. Lat. 41° 09' 52.30" Long. -75° 14' 25.30"
51	BRODCR12	8/17/06 0900	**BRODHEAD CREEK** (Stroud) Approximately 100 yards downstream of the bridge on Route 191, near its intersection with Route 447. Lat. 41° 02' 10.50" Long. -75° 12' 34.00"
52	BUSHCR07	8/17/06 0945	**BUSHKILL CREEK** (Middle Smithfield) Approximately 125 yards downstream of Middle Smithfield STP discharge. DWGNRA boundary control point. Lat. 41° 04' 57.60" Long. -75° 01' 21.00"
53	BRODCR13	8/17/06 1030	**BRODHEAD CREEK** (Smithfield) Approximately 200 yards upstream of its mouth where it meets the Delaware River. DWGNRA boundary control point. Lat. 40° 59' 26.10" Long. -75° 08' 06.10"
54	CHERCR11	8/17/06 1130	**CHERRY CREEK** (Delaware Water Gap) Over the dike at the corner of the Laird Technologies parking lot. Lat. 41° 02' 10.50" Long. -75° 12' 34.00"
55	MCMICR30	8/17/06 1215	**MCMICHAEL CREEK (**Stroudsburg) Approximately 300 yards downstream of Stroudsburg STP discharge. Lat. 40° 59' 16.63" Long. -75° 11' 06.75"
56	TUNKCR06	9/06/06 1615	**TUNKHANNOCK CREEK (**Tunkhannock) Approximately ½ mile upstream of the stone bridge on Hypsy Gap Road. Lat. 41° 02' 10.40" Long. -75° 26' 19.40"

2006 WATER QUALITY STUDY TEST SITES



SITE NUMBER	SITE ID
01	PARACR03
02	BUTZRU01
03	CRCRPA01
04	DEHOCR04
05	PARACR04
06	INDIRU01
07	POHIRU01
08	SWIPCR06
09	SWIPCR02
10	PARACR01
11	POHIRU09
12	POHIRU06
13	LEHIRI01
14	LEHIRI02
15	TOBYCR01
16	SWIPCR07
17	SWIPCR05
18	SWIPCR03
19	CRCRPA03
20	DRSARU01
21	POCOCR20
22	POCOCR16
23	POCOCR17
24	POCOCR19
25	SCOTCR04
26	POCOCR15
27	POCOCR18
28	POCOCR22
29	POCOCR14
30	MCMICR21
31	RED RU05
32	HAWKRU02
33	TROUCR05
34	TOBYCR14
35	TUNKCR03
36	JONASCR01
37	POHOCR08
38	WEIRCR02
39	POHOCR06
40	BUCKCR01
41	AQUACR09
42	AQUACR10
43	MARSCR08
44	MARSCR09
45	SAMSCR10
46	BRODCR14
47	BRODCR15
48	CRANRU02
49	MCMICR28
50	BRODCR01
51	BRODCR12
52	BUSHCR07
53	BRODCR13
54	CHERCR11
55	MCMICR30
56	TUNKCR06

METHODOLOGY

In order to establish consistency, the same parameters that have been used in previous years were again utilized in 2006.

As in the past, several parameters were tested on site with field equipment as follows:

Volume Flow	Flow Mate, Global Water Flow Probe
Temperature	HACH Model Sension 6 Dissolved Oxygen Meter
D.O.	HACH Model Sension 6 Dissolved Oxygen Meter
pH	Oakton pH pen
Conductivity	Oakton Conductivity / TDS / ºC / ºF Data Meter - CON 410 Series
T.D.S.	Oakton Conductivity / TDS / ºC / ºF Data Meter - CON 410 Series

The following is a list of test parameter methodologies and detection limits which were utilized by Prosser Laboratories in the analysis of the stream samples.

TEST	METHOD	REPORT LIMIT
pH	SM 4500HB	
Alkalinity	SM 2320B	2 mg/1
Total Hardness	SM 2340C	2 mg/1
Nitrate + Nitrite as N	SM 4500F AUTO	0.2 mg/l
Nitrate-N	SM 4500F AUTO	0.2 mg/1
Nitrite-N	SM 4500B SPEC.	0.005 mg/1
Ammonia-N	SM19 4500NH3 G	0.20 mg/1
Total Phosphorous	SM 4500 - PF	0.1 mg/1
Chloride	EPA 325.3	2 mg/1
Acidity	SM18 2310B	2 mg/1
Total Suspended Solids	SM 2540D	1.00 mg/1
Fecal Coliform	SM 18-9222D	---------
Iron	EPA 200.7	0.002 mg/l
Nickel, Dissolved	EPA 200.7	0.002 mg/l
Copper, Dissolved	EPA 200.7	0.002 mg/l
Cadmium, Dissolved	EPA 200.7	0.0005 mg/l
Arsenic, Dissolved	EPA 200.7	0.005 mg/l
Lead, Dissolved	EPA 200.7	0.002 mg/l
Zinc, Dissolved	EPA 200.7	0.002 mg/l

The benthic macroinvertebrates were collected by a standardized method. At each site two generalized kick samples were taken using a 1meter x 1meter seine. One kick is taken from a riffle in the stream and one kick is taken from a run. The entire sample is combined and stabilized immediately with an alcohol solution. The sample is then taken to the Monroe County Conservation District office where it is subsampled. A plastic square form of four inches by four inches is placed in the pan to provide a random subsample. A minimum sub-sample of 100 organisms is desired for a valid analysis. A professional entomologist then identified the macroinvertebrates contained in each subsample.

The macroinvertebrates are picked without the aid of magnification. Several samples are picked at random for a debris sample. The specifics of the macroinvertebrate analysis as it relates to the RBPs are discussed in Appendix A of this report.

Artificial substrate samplers are being used to sample macroinvertebrates at the site located on the Tunkhannock Creek upstream of the bridge on Hypsy Gap Road. This method of sampling was initiated due to the difficulty of sampling streams found in wetlands. Kick samples and samples from the artificial substrate samplers were collected for a period of three years. When the results from the kick sample data were compared to the artificial substrate samplers from 1997 through 1999, the same trends were noted. The macroinvertebrate communities had yielded scores that were nearly identical for three years indicating that the use of artificial substrate samplers in place of kick samples in wetland areas is viable.

The artificial substrate samplers employed were composed of eight 3" x 3" plates, spaced along an 8" eye bolt. The plates were separated using standard one inch round washers. The first group of four plates was separated using a single washer, while the second group of four plates was separated using two washers. The total surface area of the sampler was 929 cm^2. Five samplers were placed at the sampling site approximately six weeks in advance of the collection date.

Debris samples were conducted on approximately ten percent of the samples. The debris analysis is a tool for determining the percent of macroinvertebrates which may be missed during the initial analysis, a form of quality assurance and quality control (qa/qc). For the debris sample analysis a lighted magnifying lens was employed (this may contribute to a larger than expected percentage of missed individuals).

Pebble Counts were conducted on the cross section of each stream (wetted area), generally in close proximity to the individuals conducting the flow study. The individual measuring the particles would take a step reach down without looking and measure the first particle touched along its indeterminate axis. The particles were measured with an Al-Sci Field Sieve/Gravelometer and sand gauge. This procedure was repeated, sometimes making several trips back and forth across the stream in a straight line until 100 particles were measured. The percentages are calculated and graphed in the office using a Microsoft Excel spread sheet.

The flow measurements were conducted by stretching a tape measure across the stream to measure the width of the stream (wetted area). The stream is then divided into sections allowing for a minimum of ten measurement points. The average velocity is read at each of the measurement points. If the measurement points are less than two feet in depth, one reading is taken at six tenths of the depth from the bottom. If the measurement point is greater than two feet in depth, two readings are taken, one at two tenths of the depth from the bottom and one at eight tenths of the depth from the bottom. When measuring the average velocity, if no flow registers on the meter it is recorded as a zero. The cross sectional area is calculated in the office using the computer program GraphPad. The average velocity measurements are averaged and multiplied by the cross sectional area to determine the volume of flow for each stream.

During the field sampling, the water samples collected for laboratory analysis were stored in a cooler with both ice packs and ice cubes in order to stabilize the samples and then transported to Prosser Laboratories for testing.

In order to maintain consistency, two weeks in the middle of August were selected for sampling as a result of long-term flow data analysis of Monroe County streams. The end of August and the beginning of September tend to be the period of lowest flow and of optimum biological activity. Low flow testing was chosen because streams are most vulnerable to pollution at this time. It should be noted that the storm events that occurred prior to the 2006 sampling period resulted in scouring of the riparian environment which influenced the habitat assessments to be scored lower.

The Planning Commission Staff correlated the final data.

Appendix A:
Benthic Macroinvertebrates

BENTHIC MACROINVERTEBRATES

Aquatic macroinvertebrates are animals that are large enough to be seen by the unaided eye and live at least part of their life cycles within or upon available substrates in a body of water or water transport system. These include insects such as mayflies, annelids, mollusks, flatworms, roundworms, and crustaceans. The samples collected allow for a detailed analysis of the aquatic community. A brief explanation of these factors is offered to enable the reader to understand the importance of measuring the relative stability of the aquatic community.

The sampling technique is a standard kick sample format using a 500 micron mesh size, 1 meter x 1 meter seine net. Normally one sample (one square meter of substrate) is taken from a riffle in the stream and one sample (one square meter of substrate) is taken from a run. The entire sample is taken to the Monroe County Conservation District office where it is subsampled. A minimum subsample of 100 organisms is desired for a valid analysis.

The following are the metrics used for the macroinvertebrate analysis. Metrics are the various counts, indexes, and ratios computed from the results of the subsamples as described above. Different metrics convey different types of information about the macroinvertebrate community. For example, taxa richness is an index of diversity and the Hilsenhoff Biotic Index measures pollution tolerance. By using a set of metrics that measures multiple aspects of the macroinvertebrate community, a complete picture of a community can be attained.

Total Individuals is the actual number of macroinvertebrates collected.

Total Taxa (Species richness) is a measure of the variety of taxa (total number of species) present. This generally increases with increasing water quality or habitat. In some situations, organic enrichment may also result in an increase in the number of taxa.

Percent Contribution of Dominant Taxa gives an indication of the balance in the community. A community dominated by relatively few species would indicate environmental stress. An even distribution of all taxa (preferably sensitive species) is more desirable.

Percent Noninsects gives an indication of the balance in the community. Noninsects are generally tolerant species. A community dominated by noninsects would be an indication of environmental stress. An even distribution of all taxa (preferably sensitive species) is more desirable.

Modified Hilsenhoff Biotic Index (HBI) is a ranking based on pollution tolerance to organic sources values. These values range from 0-10, increasing as water quality decreases. The Biotic Index is an average of tolerance values for all individuals collected from a site.

The following demonstrates the range for Biotic Index:

0.00-3.75	Excellent
3.76-4.25	Very Good
4.26-5.00	Good
5.01-5.75	Fair
5.76-6.50	Fairly Poor
6.51-7.25	Poor
7.26-10.0	Very Poor

EPT Index is a measure of the total number of distinct taxa within the orders of Ephemeroptera, Plecoptera and Trichoptera. This summarizes the taxa richness within the insect orders that are generally sensitive to pollution. The EPT Index generally increases with increasing water quality.

Percent Intolerant Taxa gives an indication of the balance in the community. Intolerant organisms are usually not found associated with organic contaminants and are generally intolerant of even moderate reductions in dissolved oxygen. Intolerant organisms are indicators of clean water only.

The Ratio of Shredders to the Total Number of Insects uses the relative abundance of shredders as an indication of the dominant food or energy source in a small watershed. Shredders are insects that shred coarse particulate detritus for feeding. Shredders represent a distinct functional feeding group that is found predominantly in watersheds less than 10 square miles in size where the primary energy source in the stream is derived from leaf litter and similar detritus entering the watercourse. Shredders should become less abundant as the stream width increases and the canopy cover opens and photosynthesis becomes the primary energy source in the stream.

Scoring Schemes

Scoring schemes have been completed for the entire County. The EPA conducted the majority of the statistical analysis needed to determine the metrics that are used for the Pocono Plateau and Low Pocono subecoregions. The metrics were selected because of their accuracy in detecting impairment. The County completed the work for the remaining subecoregions in the County, but without the help of the EPA this work would have been much more difficult.

A simple process was used to develop the reference conditions for the different stream classes. Within each stream class, minimally impaired reference sites were sampled. Descriptive statistics for each metric were calculated from a group of similar candidate reference sites. Only the candidate reference sites with optimal habitat and intact benthic macroinvertebrate communities were included in the reference condition. Test sites, or sites thought to be impaired, were not used in the development of reference conditions. Thresholds for optimal, slightly to moderately impaired and severely impaired categories were developed for each metric. The data from each metric was compiled and ranked. If a metric increases with impact (HBI for example), the 75^{th} percentile of the reference condition is used as the threshold for the optimal category. The remaining range between that value and the maximum value obtainable for that metric was halved to provide two more ranges for scoring the slightly to moderately impaired and severely impaired categories. If the metric value decreases with impact (taxa richness for example), the 25^{th} percentile of the reference condition is used as the threshold for the

optimal category. The remaining range between that value and the minimum value was halved to provide two more ranges for scoring the slightly to moderately impaired and severely impaired categories. For some metrics, this may result in somewhat insensitive scoring. For percent noninsects, for example, the maximum possible is 100%. However, 25% was the maximum encountered in the severely impacted sites for the Pocono Plateau / Glide Pool subecoregion. The scoring was adjusted to reflect the values of that metric generally encountered in impacted streams for this subecoregion, in order to make the scoring for that metric more sensitive.

All candidate reference sites were scored using the scoring scheme for that stream classification. These scores were then ranked. The lower 25th percentile was used to define the lower range of the optimal category. The remaining range between that value and the minimum possible optimal score was bisected to define two more ranges for the slightly to moderately impaired and severely impaired categories for the total scores.

The County identified all organisms collected to the family level and all the calculations were performed using family level identifications. The family level of identification was chosen to make data sharing both easier and faster. Identification of macroinvertebrates to the family is easier to perform and yields results that are suitable for our purposes. Another reason for choosing this level of identification was the interest of local watershed groups in performing macroinvertebrate sampling. For these groups genus level identification would be too difficult and time consuming. In order for the County to accept their data, however, the identifier would have to pass a quality assurance program established by the County.

The following are tables for the scoring schemes.

Pocono Plateau, Riffle / Run < 10 square miles

Samples from Keiper Run, Beaver Creek, Cross Keys Run, Frame Cabin Run and Tripup Run were used to develop the reference condition.

Resulting scoring scheme for the reference condition for the Pocono Plateau, Riffle / Run < 10 square miles

Score Assigned →→→→ Metric	5 (Optimal)	3 (slightly to moderately impaired)	1 (Severely impaired)
Total Taxa	> = 15	14 - 8	7 - 0
EPT Taxa	> = 8	7 - 4	3 - 0
HBI	< = 5.4	5.5 - 7.7	7.8 - 10
% Intolerant Taxa	> = 35.3	35.2 - 17.7	17.6 - 0
% Noninsect	< = 2.0	2.1 - 25.0	25.1 - 100
Shredders / Total	> = 0.02	0.019 - 0.01	0.009 - 0

The reference sites were all scored using this scoring scheme. The lower 25th percentile of the reference site scores represents the lower threshold for the "optimal" category. The 25th percentile of the reference scores is 26. The range 25 - 16 will be the slightly to moderately impaired category, and any site with a total score of less than 16 will be considered severely impaired.

Pocono Plateau, Riffle / Run > 10 square miles

Samples collected from Tunkhannock Creek and Tobyhanna Creek were used to develop a reference condition for the larger streams on the plateau. Descriptive statistics for the metrics at these two sites were calculated and the resulting scoring scheme was developed as described previously. The scoring scheme for the larger streams is shown in the following table.

Resulting scoring scheme for the reference condition for the Pocono Plateau, Riffle / Run > 10 square miles

Score Assigned →→→→ Metric	5 (Optimal)	3 (slightly to moderately impaired)	1 (Severely impaired)
Total Taxa	> = 15	14 - 8	7 - 0
EPT Taxa	> = 8	7 - 4	3 - 0
HBI	< = 5.7	5.8 - 7.9	8.0 - 10
% Intolerant Taxa	> = 39.3	39.2 - 19.7	19.6 - 0
% Noninsect	< = 3.6	3.7 - 25.0	25.1 - 100
Shredders / Total	> = 0.003	0.0029 - 0.0015	0.0014 - 0

The reference sites were all scored using this scoring scheme. The 25th percentile of the reference scores is 26. The range 25 - 16 will be the slightly to moderately impaired category, and any site with a total score of less than 16 will be considered severely impaired.

Pocono Plateau, Glide / Pool

Samples collected from Tunkhannock Creek were used to develop a reference condition for the glide pool streams found in the Long Pond area. Descriptive statistics for the metrics at these sites were calculated and the resulting scoring scheme was developed as described previously. The scoring scheme for the glide pool streams is shown in the following table.

Resulting scoring scheme for the reference condition for the Pocono Plateau, Glide / Pool

Score Assigned →→→→ Metric	5 (Optimal)	3 (slightly to moderately impaired)	1 (Severely impaired)
Total Taxa	> = 15	14 - 8	7 - 0
EPT Taxa	> = 6	5 - 3	2 - 0
HBI	< = 5.5	5.6 - 7.8	7.9 - 10
% Intolerant Taxa	> = 26.7	26.6 - 13.4	13.3 - 0
% Noninsect	0	>0 - 25.0	25.1
Shredders / Total	> = 0.01	0.009 - 0.005	0.0049 - 0

The reference sites were all scored using this scoring scheme. The lower 25th percentile of the reference site scores represents the lower threshold for the "optimal" category. The 25th percentile of the reference scores is 28. The range 27 - 17 will be the slightly to moderately impaired category, and any site with a total score of less than 17 will be considered severely impaired.

Low Pocono, Riffle / Run < 10 square miles

Samples from Spruce Cabin Run and Buck Hill, Rattlesnake, Mill, Poplar Run, Devils Hole, Fall, Poplar and Swiftwater Creeks were used in developing a scoring scheme for this region. Descriptive statistics for the metrics at these sites were calculated, and the resulting scoring scheme was developed as described earlier. The main difference between the metrics from the Pocono Plateau and Low Pocono subecoregions is the inclusion of the percent dominant family for the Low Pocono.

Resulting scoring scheme for the reference condition for the Low Pocono, Riffle / Run < 10 square miles

Score Assigned →→→→ Metric	5 (Optimal)	3 (slightly to moderately impaired)	1 (Severely impaired)
Total Taxa	> = 16	15 - 8	7 - 0
EPT Taxa	> = 11	10 - 6	5 - 0
HBI	< = 4.5	4.6 - 7.3	7.4 - 10
% Dominant Family	< = 42.6	42.7 - 71.3	71.4 - 100
% Intolerant Taxa	> = 55.6	55.5 - 27.8	27.7 - 0
% Noninsect	< = 0	0 - 25.0	25.1 - 100
Shredders / Total	> = 0.11	0.10 - 0.06	0.05 - 0

The reference sites were all scored using this scoring scheme. The 25th percentile of the reference sites scores is 31. The range 30 - 19 will be the slightly to moderately impaired category, and any site with a total score less than 19 will be considered severely impaired.

Low Pocono, Riffle / Run > 10 square miles

Samples collected from the Bushkill, McMichael, Brodhead, Paradise, and Pocono Creeks were calculated and the resulting scoring scheme was developed.

Resulting scoring scheme for the reference condition for the Low Pocono, Riffle / Run > 10 square miles

Score Assigned →→→→ Metric	5 (Optimal)	3 (slightly to moderately impaired)	1 (Severely impaired)
Total Taxa	> = 17	16 - 9	8 - 0
EPT Taxa	> = 10	9 - 5	4 - 0
HBI	< = 5.6	5.7 - 7.8	7.9 - 10
% Dominant Family	< = 46.3	46.4 - 73.2	73.3 - 100
% Intolerant Taxa	> = 35.7	35.6 - 17.9	17.8 - 0
% Noninsect	< = 9.6	9.7 - 25.0	25.1 - 100
Shredders / Total	> = 0.03	0.029 - 0.015	0.014 - 0

The reference sites were all scored using this scoring scheme. The 25th percentile of the reference scores is 29. The range 28 - 18 will be the slightly to moderately impaired category, and any site with a total score of less than 18 will be considered severely impaired.

Northern Shale Valleys and Slopes, Riffle / Run < 10 square miles

Samples collected from the Princess, Ross Common, and Cherry Creeks were calculated and the resulting scoring scheme was developed. This scoring scheme follows the work that has been completed for the Low Pocono subecoregions in that it also includes the percent dominant family metric.

Resulting scoring scheme for the reference condition for the Northern Shale Valleys and Slopes, Riffle / Run < 10 square miles

Score Assigned →→→→ Metric	5 (Optimal)	3 (slightly to moderately impaired)	1 (Severely impaired)
Total Taxa	> = 18	17 - 9	8 - 0
EPT Taxa	> = 9	8 - 4	3 - 0
HBI	< = 5.0	5.1 - 7.5	7.6 - 10
% Dominant Family	< = 34.9	35.0 - 71.4	71.5 - 100
% Intolerant Taxa	> = 26.1	26.2 - 13.0	12.9 - 0
% Noninsect	< = 5.6	5.7 - 25.0	25.1 - 100
Shredders / Total	> = 0.14	0.139 - 0.070	0.069 - 0

The reference sites were all scored using this scoring scheme. The 25th percentile of the reference scores is 31. The range 30 - 18 will be the slightly to moderately impaired category, and any site with a total score of less than 18 will be considered severely impaired. It should be noted that only six sites were used in creating this scoring scheme. It will be adjusted after further studies have provided more data.

Northern Shale Valleys and Slopes, Riffle / Run > 10 square miles

Samples collected from the McMichael, Pohopoco, Aquashicola, Cherry, and Buckwha Creeks were calculated and the resulting scoring scheme was developed.

Resulting scoring scheme for the reference condition for the Northern Shale Valleys and Slopes, Riffle / Run > 10 square miles

Score Assigned →→→→ Metric	5 (Optimal)	3 (slightly to moderately impaired)	1 (Severely impaired)
Total Taxa	> = 19	18 - 10	9 - 0
EPT Taxa	> = 11	10 - 6	5 - 0
HBI	< = 5.1	5.2 - 7.6	7.7 - 10
% Dominant Family	< = 42.6	42.7 - 71.4	71.5 - 100
% Intolerant Taxa	> = 28.6	28.5 - 14.3	14.2 - 0
% Noninsect	< = 3.9	4.0 - 25.0	25.1 - 100
Shredders / Total	> = 0.02	0.019 - 0.009	0.008 - 0

The reference sites were all scored using this scoring scheme. The 25th percentile of the reference scores is 31. The range 30 - 18 will be the slightly to moderately impaired category, and any site with a total score of less than 18 will be considered severely impaired.

Northern Sandstone Ridges, Riffle / Run

Samples collected from the Poplar, Caledonia and Ross Common Creeks were calculated and the resulting scoring scheme was developed.

Resulting scoring scheme for the reference condition for the Northern Sandstone Ridges, Riffle / Run

Score Assigned →→→→ Metric	5 (Optimal)	3 (slightly to moderately impaired)	1 (Severely impaired)
Total Taxa	> = 16	15 - 8	7 - 0
EPT Taxa	> = 10	9 - 5	4 - 0
HBI	< = 3.9	4.0 - 7.0	7.1 - 10
% Dominant Family	< = 24.1	24.2 - 62.1	62.2 - 100
% Intolerant Taxa	> = 37.5	37.4 - 18.8	18.7 - 0
% Noninsect	< = 2.2	2.3 - 51.2	51.3 - 100
Shredders / Total	> = 0.09	0.089 - 0.045	0.044 - 0

The reference sites were all scored using this scoring scheme. The 25th percentile of the reference scores is 33. The range 32 - 17 will be the slightly to moderately impaired category, and any site with a total score of less than 16 will be considered severely impaired.

MACROINVERTEBRATE SUMMARY

The following tables show results for the Pocono Plateau, Low Pocono and Northern Shale Valleys and Slopes streams using the EPA/County scoring schemes.

Scores for samples for the Pocono Plateau,
Riffle / Run < 10 square miles

Stream Name	Sample Number	Type of Site	Score	Condition
Red Run	REDRU03	Monitor	22	Slightly Impaired
Hawkey Run	HAWKRU02	Monitor	14	Severely Impaired

The range 30 - 26 is considered optimal. The range 25 - 16 is the slightly to moderately impaired category, and any site with a total score of less than 16 is considered severely impaired.

Scores for samples for the Pocono Plateau,
Riffle / Run > 10 square miles

Stream Name	Sample Number	Type of Site	Score	Condition
Tobyhanna Creek	TOBYCR01	Reference	22	Slightly Impaired
Tunkhannock Creek	TUNKCR03	Reference	28	Optimal
Trout Creek	TROUCR03	Monitor	18	Moderately Impaired
Tobyhanna Creek	TOBYCR14	Monitor	24	Slightly Impaired
Lehigh River	LEHIRI01	New	28	Optimal
Lehigh River	LEHIRI02	New	26	Optimal

The range 30 - 26 is considered optimal. The range 25 - 16 is the slightly to moderately impaired category, and any site with a total score of less than 16 is considered severely impaired.

Scores for samples for the Pocono Plateau,
Glide Pool

Stream Name	Sample Number	Type of Site	Score	Condition
Tunkhannock Creek	TUNKCR06	Reference	24	Slightly Impaired

The range 30 - 29 is considered optimal. The range 28 - 17 is the slightly to moderately impaired category, and any site with a total score of less than 17 is considered severely impaired.

Scores for samples for the Low Pocono,
Riffle / Run < 10 square miles

Stream Name	Sample Number	Type of Site	Score	Condition
Butz Run	BUTZRU01	Monitor	23	Moderately Impaired
Cranberry Creek (Paradise Twp)	CRCRPA01	Monitor	27	Slightly Impaired
Paradise Creek	PARACR04	Monitor	31	Optimal
Devils Hole Creek	DEHOCR04	Monitor	31	Optimal
Cranberry Creek (Stroud Twp)	CRANCR01	New	19	Moderately Impaired
Forest Hills Run	FOHIRU01	Monitor	25	Slightly Impaired
Forest Hills Run	FOHIRU06	Monitor	19	Moderately Impaired
Forest Hills Run	FOHIRU09	Monitor	15	Severely Impaired
Indian Run	INDIRU01	Monitor	29	Slightly Impaired
Swiftwater Creek	SWIFCR06	Monitor	23	Moderately Impaired
Swiftwater Creek	SWIFCR02	Monitor	17	Moderately Impaired
Swiftwater Creek	SWIFCR07	Monitor	27	Slightly Impaired
Swiftwater Creek	SWIFCR05	Monitor	25	Slightly Impaired
Cranberry Creek (Barrett Twp)	CRCRPA03	Monitor	27	Slightly Impaired
Dry Sawmill Run	DRSARU01	Monitor	25	Slightly Impaired
Pocono Creek	POCOCR20	Monitor	27	Slightly Impaired
Pocono Creek	POCOCR16	Monitor	27	Slightly Impaired
Pocono Creek	POCOCR17	Monitor	19	Moderately Impaired
Scotrun Creek	SCOTCR04-(A)	Monitor	17	Moderately Impaired
Scotrun Creek	SCOTCR04-(B)	Duplicate	23	Moderately Impaired
Swiftwater Creek	SWIFCR03	Monitor	25	Slightly Impaired
Jonas Creek	JONASCR01	New	29	Slightly Impaired

The range 35 - 31 is considered optimal. The range 30 - 16 is the slightly to moderately impaired category, and any site with a total score of less than 16 is considered severely impaired.

Scores for samples for the Low Pocono,
Riffle / Run > 10 square miles

Stream Name	Sample Number	Type of Site	Score	Condition
Paradise Creek	PARACR03-(A)	Monitor	27	Slightly Impaired
Paradise Creek	PARACR03-(B)	Duplicate	25	Slightly Impaired
Paradise Creek	PARACR01	Monitor	25	Moderately Impaired
Pocono Creek	POCOCR15	Monitor	31	Optimal
Pocono Creek	POCOCR19	Monitor	31	Optimal
Brodhead Creek	BRODCR01	Reference	35	Optimal
Brodhead Creek	BRODCR12	Monitor	31	Optimal
Bushkill Creek	BUSHCR07	Monitor / Reference	29	Optimal
Pohopoco Creek	POHOCR06	Monitor	31	Optimal

The range 35 - 29 is considered optimal. The range 28 - 14 is the slightly to moderately impaired category, and any site with a total score of less than 14 is considered severely impaired.

Scores for samples for the Northern Shale Valleys and Slopes,
Riffle / Run < 10 square miles

Stream Name	Sample Number	Type of Site	Score	Condition
Buckwha Creek	BUCKCR01	Monitor	31	Optimal
Aquashicola Creek	AQUACR09	Monitor	33	Optimal
Aquashicola Creek	AQUACR10	Monitor	33	Optimal
Sambo Creek	SAMBCR10	Monitor	17	Severely Impaired
Weir Creek	WEIRCR02	New	21	Moderately Impaired

The range 35 - 31 is considered optimal. The range 30 - 18 is the slightly to moderately impaired category, and any site with a total score of less than 18 is considered severely impaired.

Scores for samples for the Northern Shale Valleys and Slopes,
Riffle / Run > 10 square miles

Stream Name	Sample Number	Type of Site	Score	Condition
Pocono Creek	POCOCR18	Monitor	25	Slightly Impaired
Pocono Creek	POCOCR22	Monitor	31	Optimal
Pocono Creek	POCOCR14	Monitor / Reference	25	Slightly Impaired
McMichaels Creek	MCMICR21	Monitor / Reference	25	Slightly Impaired
Marshalls Creek	MARSCR08	Monitor	25	Slightly Impaired
Marshalls Creek	MARSCR09	Monitor	25	Slightly Impaired
McMichael Creek	MCMICR30	Monitor	21	Moderately Impaired
McMichael Creek	MCMICR28	Monitor	21	Moderately Impaired
Brodhead Creek	BRODCR15	New	29	Slightly Impaired
Cherry Creek	CHERCR11	Monitor	31	Optimal
Brodhead Creek	BRODCR13	Monitor	15	Severely Impaired
Brodhead Creek	BRODCR14	New	31	Optimal
Pohopoco Creek	POHOCR08	New	31	Optimal

The range 35 - 31 is considered optimal. The range 30 - 18 is the slightly to moderately impaired category, and any site with a total score of less than 18 is considered severely impaired.

The following tables compare trending results of the EPA/County scoring schemes for repeat sites (1996 through 2006).

Site #	Site ID	Site Name	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996
1	PARACR03	Paradise Creek	27/25	35	33	31							
2	BUTZRU01	Butz Run	23	23	29	23							
3	CRCRPA01	Cranberry Creek (Paradise)	27	29	29								
4	DEHOCR04	Devils Hole Creek	31	33	31	31							
5	PARACR04	Paradise Creek	31	33	33	31							
6	INDIRU01	Indian Run	29	33		31							
7	FOHIRU01	Forest Hills Run	25	29	29	25							
8	SWIFCR06	Swiftwater Creek	23	25	21	23							
9	SWIFCR02	Swiftwater Creek	17	27	25	27							
10	PARACR01	Paradise Creek	25	33	29	29							
11	FOHIRU09	Forest Hills Run	15	21	15	17							
12	FOHIRU06	Forest Hills Run	19										
13	LEHIRI01	Lehigh River	28										
14	LEHIRI02	Lehigh River	26										
15	TOBYCR01	Tobyhanna Creek	22	28	22	26	26	22	24	20	14	18	
16	SWIFCR07	Swiftwater Creek	27	29	29	25	29	33					
17	SWIFCR05	Swiftwater Creek	25	33	33	23	25	29	27	25	29	21	25
18	SWIFCR03	Swiftwater Creek	25	27	29	29	25	29	29	17	27	19	27
19	CRCRPA03	Cranberry Creek (Barrett)	27		21	23							
20	DRSARU01	Dry Sawmill Run	25	19	21	27	31	21	23			29	
21	POCOCR20	Pocono Creek	27	35	27	23	29	27					
22	POCOCR16	Pocono Creek	27	27	27	25	31	23	29	29			
23	POCOCR17	Pocono Creek	19	31	21	23	33	29	33				
24	POCOCR19	Pocono Creek	31	31	31	27	35	33					
25	SCOTCR04	Scotrun Creek	17/23	23	27	27	31	29					
26	POCOCR15	Pocono Creek	31	33	35	29	31	35	31	27			
27	POCOCR18	Pocono Creek	25	28	33	33	31	31	27				
28	POCOCR22	Pocono Creek	31	35	33								
29	POCOCR14	Pocono Creek	25	29	23	27	29	25	21	29			

Site #	Site ID	Site Name	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996
30	MCMICR21	McMichael Creek	25	23	25	25	31	33	25	29	27	25	31
31	REDRU03	Red Run	22	22	24	22	24						
32	HAWKRU02	Hawkey Run	14										
33	TROUCR03	Trout Creek	18										
34	TOBYCR14	Tobyhanna Creek	24	26									
35	TUNKCR03	Tunkhannock Creek	28	28	28	28	30	28	26	26	28	30	30
36	JONASCR01	Jonas Creek	29										
37	POHOCR08	Pohopoco Creek	31										
38	WEIRCR02	Weir Creek	21										
39	POHOCR06	Pohopoco Creek	31	31	33	35	33	31	33	33	33	31	33
40	BUCKCR01	Buckwha Creek	31	31									
41	AQUACR09	Aquashicola Creek	33	35	29	27	29	33	31	33	29	35	35
42	AQUACR10	Aquashicola Creek	33	33	33								
43	MARSCR08	Marshalls Creek	25	33	27	23	23	27	25	19	27	19	23
44	MARSCR09	Marshalls Creek	25	25/25	25	23	31	29	25	31	25	21	25
45	SAMBCR10	Sambo Creek	17	25	31								
46	BRODCR14	Brodhead Creek	31										
47	BRODCR15	Brodhead Creek	29										
48	CRANCR01	Cranberry Creek (Stroud)	19										
49	MCMICR28	McMichael Creek	21	25	21	23							
50	BRODCR01	Brodhead Creek	35	33	35	35/31	35	35	33	35	35	33	35
51	BRODCR12	Brodhead Creek	31	33	29	29	29	29	29	29	29	27	29
52	BUSHCR07	Bushkill Creek	29	31	27	29	29	31	27	29	27	33	29
53	BRODCR13	Brodhead Creek	15	19		23/25	29	27	21	29	27	27	11
54	CHERCR11	Cherry Creek	31		29	33	31	29	33	27	29		
55	MCMICR30	McMichael Creek	21	21	27								
56	TUNKCR06	Tunkhannock Creek	24	24	22	24	20	28	24	20	18	18	

Debris Sample Analysis - 2006

SITE #	10	10	20	20	30	30
SITE ID	PARACR01	PARACR01 - DS	DRSARU01	DRSARU01- DS	MCMICR21	MCMICR21 - DS
Number of Organisms	335	379	147	165	293	335
Number of Taxa	16	17	17	17	14	14
HBI	5.68	5.77	5.59	5.56	5.34	5.49
EPT Index	9	9	11	11	9	9
% Contrib. of Dom. Taxa	44.2	47.2	46.9	44.2	32.8	38.2
% Intolerant Taxa (0-2 TV)	25.0	23.5	35.3	35.3	28.6	28.6
% Non-insects	0.00	0.26	0.00	0.00	0.68	0.60
Shredders/Total	0.006	0.005	0.007	0.006	0.000	0.000

SITE #	40	40	50	50		
SITE ID	BUCKCR01	BUCKCR01-DS	BRODCR01	BRODCR01-DS		
Number of Organisms	231	276	234	260		
Number of Taxa	15	16	23	25		
HBI	4.68	4.79	4.44	4.62		
EPT Index	11	11	15	16		
% Contrib. of Dom. Taxa	32.0	33.7	32.9	36.9		
% Intolerant Taxa (0-2 TV)	46.7	43.8	39.1	40.0		
% Non-insects	0.00	0.00	0.43	0.38		
Shredders/Total	0.009	0.007	0.085	0.077		

The Debris Sample (DS) column shows the composite of the original count + the debris sample count.

PARACR01 (Paradise Creek) was the first debris sample site. In the composite sample, PARACR01 - DS, 11.60% of the total number of organisms were found in the debris analysis. The debris sample for this site was comprised predominantly of chironomidae (47%).

The second composite sample was DRSARU01 (Dry Sawmill Run) - DS, 10.9% of the organisms were found in the debris sample. Two taxa dominated the debris sample for this site, chironomidae (44.2%) and baetidae (27.8%).

MCMICR21 (McMichael Creek) was the third site tested to include a debris sample analysis. The debris sample comprised approximately 12.5% of the composite sample at this site. Two taxa dominated the debris sample for this site, chironomidae (38.2%) and hydropsychidae (16.7%).

BUCKCR01 (Buckwha Creek) was the fourth site tested to include a debris sample analysis. The debris sample comprised approximately 16.3% of the composite sample at this site. The dominant taxon for this site was heptageniidae (23.6%).

The final site chosen for a debris sample was BRODCR01 (Brodhead Creek). At this site, the debris sample comprised 10% of the composite sample. The debris sample for this site was composed predominantly of chironomidae (36.9%).

The method of debris sample analysis involved the naked eye and a 2x magnification lens. Due to the size of these creatures the debris samples were found primarily because of the use of the magnifying lens

The method of sorting of debris samples involved (naked eye and a 2x magnification lens), due to the size of these creatures the debris sample analysis were found primarily because of the use of the magnifying lens.

In future studies work will continue to refine this method of quality assurance and control.

MCWQS - 2006	SITE # 1	SITE ID. PARACR03 (1A)			
Insecta		Philopotamidae	14	Simuliidae	
Ephemeroptera		Polycentropodidae	2	Tabanidae	
Baetidae	16	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae	3	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	6	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	5	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae	2	Platyhelminthes	
Tricorythidae	1	Hydroptilidae	1	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	3	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	2	Gammaridae	
Perlidae	1	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae	1	Arachnidia	
Corixidae		Tipulidae	1	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	66		
Trichoptera		Culicidae			
Hydropsychidae	32	Muscidae			

MCWQS - 2006 SITE # 1 SITE ID. PARACR03 (1B)					
Insecta		Philopotamidae	39	Simuliidae	1
Ephemeroptera		Polycentropodidae	15	Tabanidae	
Baetidae	23	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	8	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	4	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	4	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	5	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	1	Gammaridae	
Perlidae	4	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae	1	Tipulidae	1	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	63		
Trichoptera		Culicidae			
Hydropsychidae	41	Muscidae			

MCWQS - 2006 SITE # 2 SITE ID. BUTZRU01					
Insecta		Philopotamidae	42	Simuliidae	1
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	23	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	3	Leptoceridae	1	Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	1	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	1	Psephenidae		Limnaeidae	
Leuctridae	3	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	1	Corydalidae	1	Gammaridae	
Perlidae	4	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae	3	Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	41		
Trichoptera		Culicidae			
Hydropsychidae	61	Muscidae			

MCWQS - 2006 SITE # 3 SITE ID. CRCRPA01					
Insecta		Philopotamidae	26	Simuliidae	2
Ephemeroptera		Polycentropodidae	7	Tabanidae	
Baetidae	13	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	15	Leptoceridae		Nematomorpha	
Leptophlebiidae	1	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	33	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	16	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	3	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	9	Psephenidae		Limnaeidae	
Leuctridae	2	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	
Perlidae	2	Sialidae		Talitridae	
Perlodidae	5	Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae	1	Arachnidia	
Corixidae		Tipulidae	7	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae	1	Chironomidae	37		
Trichoptera		Culicidae			
Hydropsychidae	41	Muscidae			

MCWQS - 2006 SITE # 4 SITE ID. DEHOCR04					
Insecta		Philopotamidae	12	Simuliidae	3
Ephemeroptera		Polycentropodidae	11	Tabanidae	
Baetidae	93	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	27	Leptoceridae	1	Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	7	Turbellaria	
Odonata		Rhyacophilidae	1	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	1	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	31	Psephenidae		Limnaeidae	
Leuctridae	2	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	11	Corydalidae		Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae	3	Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	7	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	32		
Trichoptera		Culicidae			
Hydropsychidae	9	Muscidae			

MCWQS - 2006 SITE # 5 SITE ID. PAPACR04					
Insecta		Philopotamidae	14	Simuliidae	3
Ephemeroptera		Polycentropodidae	2	Tabanidae	
Baetidae	52	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	1	Leptoceridae		Nematomorpha	
Leptophlebiidae	1	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	1
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	1	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	1	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	3	Psephenidae		Limnaeidae	
Leuctridae	24	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	14	Corydalidae		Gammaridae	
Perlidae	2	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae	7	Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	1	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	23		
Trichoptera		Culicidae			
Hydropsychidae	9	Muscidae			

MCWQS - 2006 SITE # 6 SITE ID.INDIRU01					
Insecta		Philopotamidae	2	Simuliidae	
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	18	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae	2	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	1	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae	1	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae	1	Platyhelminthes	
Tricorythidae		Hydroptilidae	6	Turbellaria	
Odonata		Rhyacophilidae	1	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	7
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	14	Psephenidae		Limnaeidae	
Leuctridae	3	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	1	Corydalidae		Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae	7	Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	4	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	23		
Trichoptera		Culicidae			
Hydropsychidae	4	Muscidae			

MCWQS - 2006 SITE # 7 SITE ID. FOHIRU01					
Insecta		Philopotamidae		Simuliidae	2
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	6	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	2	Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	8	Leptoceridae		Nematomorpha	
Leptophlebiidae	3	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	7	Psephenidae		Limnaeidae	
Leuctridae	2	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	3	Gammaridae	
Perlidae	4	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	5	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	27		
Trichoptera		Culicidae			
Hydropsychidae	37	Muscidae			

MCWQS - 2006 SITE # 8 SITE ID. SWIFCR06					
Insecta		Philopotamidae	31	Simuliidae	16
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	8	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae	1	Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	10	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae	2	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	3
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	23
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	8	Ancylidae	
Lestidae		Hydraenidae		Physidae	3
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	4	Gammaridae	
Perlidae	2	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae	1	Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	72		
Trichoptera		Culicidae			
Hydropsychidae	71	Muscidae			

MCWQS - 2006 SITE # 9 SITE ID. SWIFCR02					
Insecta		Philopotamidae	24	Simuliidae	19
Ephemeroptera		Polycentropodidae	5	Tabanidae	
Baetidae	13	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	6	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	2	Turbellaria	
Odonata		Rhyacophilidae	1	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	3
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	1	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	1	Psephenidae	2	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae	1	Arachnidia	
Corixidae		Tipulidae	2	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	66		
Trichoptera		Culicidae			
Hydropsychidae	127	Muscidae			

MCWQS - 2006 SITE # 10 SITE ID.PARACR01					
Insecta		Philopotamidae	13	Simuliidae	17
Ephemeroptera		Polycentropodidae	6	Tabanidae	
Baetidae	47	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	2	Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	26	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	4	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	4	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	1	Psephenidae	1	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	1	Corydalidae	7	Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	1	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	148		
Trichoptera		Culicidae			
Hydropsychidae	56	Muscidae			

MCWQS - 2006 SITE # 11 SITE ID. FOHIRU09					
Insecta		Philopotamidae	2	Simuliidae	13
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	5	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae		Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	6
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	1	Corydalidae	2	Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	109		
Trichoptera		Culicidae			
Hydropsychidae	118	Muscidae			

MCWQS - 2006 SITE # 12 SITE ID. FOHIRU06					
Insecta		Philopotamidae	16	Simuliidae	27
Ephemeroptera		Polycentropodidae	2	Tabanidae	
Baetidae	85	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae	1	Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae		Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	1
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae	1	Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae	1	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae	1	Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	2
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	8	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	149		
Trichoptera		Culicidae			
Hydropsychidae	71	Muscidae			

MCWQS - 2006 SITE # 13 SITE ID. LEHIRI01					
Insecta		Philopotamidae		Simuliidae	4
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	19	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae	2	Brachycentridae	1	Poduridae	
Ephemerellidae	1	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	20	Leptoceridae		Nematomorpha	
Leptophlebiidae	2	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	18	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae	6	Hydroptilidae	28	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae	1	Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	1
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	8	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	
Perlidae	4	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	4	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	76		
Trichoptera		Culicidae			
Hydropsychidae	33	Muscidae			

MCWQS - 2006 SITE #14 SITE ID. LEHIRI02					
Insecta		Philopotamidae		Simuliidae	
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	9	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae	3	Brachycentridae	4	Poduridae	
Ephemerellidae	2	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	7	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae	4	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	6	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	22	Turbellaria	
Odonata		Rhyacophilidae	1	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	2	Dytiscidae		Sphaeriidae	17
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae	1	Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	2	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	9	Gammaridae	
Perlidae	4	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	1	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	59		
Trichoptera		Culicidae			
Hydropsychidae	19	Muscidae			

MCWQS - 2006 SITE # 15 SITE ID. TOBYCR01					
Insecta		Philopotamidae	6	Simuliidae	2
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	33	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae	2	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	18	Leptoceridae		Nematomorpha	
Leptophlebiidae	3	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	24	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	3
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	6	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	19
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	5	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	4	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	4	Gammaridae	
Perlidae	14	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	67		
Trichoptera		Culicidae			
Hydropsychidae	84	Muscidae			

MCWQS - 2006 SITE # 16 SITE ID. SWIFCR07					
Insecta		Philopotamidae	33	Simuliidae	2
Ephemeroptera		Polycentropodidae	1	Tabanidae	
Baetidae	17	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	13	Poduridae	
Ephemerellidae	1	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	5	Leptoceridae		Nematomorpha	
Leptophlebiidae	3	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	6	Turbellaria	
Odonata		Rhyacophilidae	2	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	4
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	2	Psephenidae		Limnaeidae	
Leuctridae	9	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	5	Corydalidae		Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae	2	Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	7	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	86		
Trichoptera		Culicidae			
Hydropsychidae	23	Muscidae			

MCWQS - 2006 SITE # 17 SITE ID. SWIFCR05					
Insecta		Philopotamidae	1	Simuliidae	9
Ephemeroptera		Polycentropodidae	1	Tabanidae	
Baetidae	17	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	15	Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae		Leptoceridae		Nematomorpha	
Leptophlebiidae	1	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	3	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	11	Psephenidae		Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	2	Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae	1	Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae	3	Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	6	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	46		
Trichoptera		Culicidae			
Hydropsychidae	26	Muscidae			

MCWQS - 2006 SITE # 18 SITE ID. SWIFCR03					
Insecta		Philopotamidae	4	Simuliidae	47
Ephemeroptera		Polycentropodidae	5	Tabanidae	1
Baetidae	84	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	6	Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	7	Leptoceridae		Nematomorpha	
Leptophlebiidae	3	Limnephilidae	1	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	2	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	13	Psephenidae		Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	
Perlidae	1	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	12	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	76		
Trichoptera		Culicidae			
Hydropsychidae	47	Muscidae			

MCWQS - 2006 SITE # 19 SITE ID. CRCRPA03					
Insecta		Philopotamidae		Muscidae	
Ephemeroptera		Polycentropodidae		Simuliidae	
Baetidae		Psychomyiidae		Tabanidae	
Baetiscidae		Beraeidae		Dixidae	
Caenidae		Brachycentridae		Collembola	
Ephemerellidae		Lepidostomatidae		Poduridae	
Ephemeridae		Helicopsychidae		Nemertea	
Heptageniidae	13	Leptoceridae		Nematoda	
Leptophlebiidae		Limnephilidae		Nematomorpha	
Metretopodidae		Molannidae		Annelida	
Neoephemeridae		Odontoceridae		Hirudinea	
Oligoneuriidae		Phryganeidae		Oligochaeta	
Polymitarcyidae		Sericostomatidae		Lumbriculida	
Potamanthidae		Uenoidae		Lumbriculidae	
Siphlonuridae		Glossosomatidae		Tubificida	
Tricorythidae		Hydroptilidae	3	Platyhelminthes	
Odonata		Rhyacophilidae		Turbellaria	
Aeshnidae	1	Lepidoptera		Planariidae	
Cordulegastridae		Pyralidae		Mollusca	
Corduliidae		Coleoptera		Bivalva	
Gomphidae	2	Dytiscidae		Unionidae	
Libellulidae		Gyrinidae		Sphaeriidae	6
Macromiidae		Haliplidae		Cyrenidae	
Calopterygidae		Noteridae		Corbiculidae	
Coenagrionidae		Elmidae	11	Gastropoda	
Lestidae		Hydraenidae		Ancylidae	
Plecoptera		Curculionidae	1	Physidae	
Capniidae		Hydrophilidae		Planorbidae	
Chloroperlidae		Limnichidae		Bulimidae	
Leuctridae	5	Psephenidae		Limnaeidae	
Nemouridae		Ptilodactylidae		Crustacea	
Peltoperlidae	7	Megaloptera		Amphipoda	
Perlidae	1	Corydalidae	1	Gammaridae	
Perlodidae	1	Sialidae	1	Talitridae	
Pteronarcyidae		Neuroptera		Isopoda	
Taeniopterygidae		Sisyridae		Asellidae	
Hemiptera		Diptera		Decapoda	
Belostomatidae		Ephydridae		Cambaridae	1
Corixidae		Athericidae		Arachnidia	
Gerridae		Tipulidae		Acari	
Mesoveliidae		Empididae		Hydrachnidia	
Notonectidae		Blephariceridae			
Saldidae		Ceratopogonidae			
Veliidae		Chaoboridae			
Trichoptera		Chironomidae	32		
Hydropsychidae	21	Culicidae			

MCWQS - 2006 SITE # 20 SITE ID. DRSARU01					
Insecta		Philopotamidae	2	Simuliidae	5
Ephemeroptera		Polycentropodidae	4	Tabanidae	
Baetidae	33	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	1	Poduridae	
Ephemerellidae	1	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	2	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	5	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae	1	Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	3	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	3	Psephenidae		Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	6	Gammaridae	
Perlidae	2	Sialidae	1	Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	69		
Trichoptera		Culicidae			
Hydropsychidae	8	Muscidae			

MCWQS - 2006 SITE # 21 SITE ID. POCOCR20					
Insecta		Philopotamidae	13	Simuliidae	11
Ephemeroptera		Polycentropodidae	12	Tabanidae	
Baetidae	60	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	3	Leptoceridae		Nematomorpha	
Leptophlebiidae	1	Limnephilidae	2	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae	1	Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	3	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	3	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	10	Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	2	Corydalidae		Gammaridae	
Perlidae	3	Sialidae		Talitridae	
Perlodidae	1	Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	3	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae	1		
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	77		
Trichoptera		Culicidae			
Hydropsychidae	46	Muscidae			

MCWQS - 2006 SITE # 22 SITE ID. POCOCR16					
Insecta		Philopotamidae	7	Simuliidae	59
Ephemeroptera		Polycentropodidae	1	Tabanidae	
Baetidae	122	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	3	Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	3	Leptoceridae		Nematomorpha	
Leptophlebiidae	1	Limnephilidae	1	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae	1	Platyhelminthes	
Tricorythidae		Hydroptilidae	9	Turbellaria	
Odonata		Rhyacophilidae	1	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae	4	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	3	Corydalidae	1	Gammaridae	
Perlidae	3	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	2	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	103		
Trichoptera		Culicidae			
Hydropsychidae	94	Muscidae			

MCWQS - 2006 SITE # 23 SITE ID. POCOCR17					
Insecta		Philopotamidae		Simuliidae	12
Ephemeroptera		Polycentropodidae	7	Tabanidae	
Baetidae	78	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	4	Poduridae	
Ephemerellidae	3	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	4	Leptoceridae		Nematomorpha	
Leptophlebiidae	2	Limnephilidae		Annelida	
Metretopodidae		Molannidae	1	Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	13	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	2
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	5	Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	4	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	73		
Trichoptera		Culicidae			
Hydropsychidae	23	Muscidae			

MCWQS - 2006 SITE # 24 SITE ID. POCOCR19					
Insecta		Philopotamidae	30	Simuliidae	52
Ephemeroptera		Polycentropodidae	4	Tabanidae	
Baetidae	82	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	2	Poduridae	
Ephemerellidae		Lepidostomatidae	2	Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	8	Leptoceridae	1	Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	2	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae	11	Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae	3	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	1
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	
Perlidae	1	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	3	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae	4		
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae	1	Chironomidae	137		
Trichoptera		Culicidae			
Hydropsychidae	53	Muscidae			

MCWQS - 2006		SITE # 25		SITE ID. SCOTCR04-A	
Insecta		Philopotamidae	3	Simuliidae	2
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	11	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	2	Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	2	Leptoceridae		Nematomorpha	
Leptophlebiidae	3	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	3	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	4	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	5	Ancylidae	5
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	2	Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	4	Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	1	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	63		
Trichoptera		Culicidae			
Hydropsychidae	24	Muscidae			

MCWQS - 2006	SITE # 25	SITE ID. SCOTCR04-B			
Insecta		Philopotamidae		Simuliidae	
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	11	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae	1	Brachycentridae		Poduridae	
Ephemerellidae	2	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	8	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae	2	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	1	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae	1	Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae	2	Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	4	Dytiscidae		Sphaeriidae	1
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	5	Ancylidae	1
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	1	Psephenidae	4	Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	2	Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	5	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	47		
Trichoptera		Culicidae			
Hydropsychidae	34	Muscidae			

MCWQS - 2006 SITE # 26 SITE ID. POCOCR15					
Insecta		Philopotamidae	7	Simuliidae	2
Ephemeroptera		Polycentropodidae	3	Tabanidae	
Baetidae	57	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	1	Poduridae	
Ephemerellidae	3	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	32	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae	1	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	8	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	1
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	3	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	13	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	15	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	1	Corydalidae		Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	5	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	94		
Trichoptera		Culicidae			
Hydropsychidae	59	Muscidae			

MCWQS - 2006 SITE # 27 SITE ID. POCOCR18					
Insecta		Philopotamidae	18	Simuliidae	3
Ephemeroptera		Polycentropodidae	4	Tabanidae	
Baetidae	93	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	11	Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	21	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae	4	Hydroptilidae	3	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae	1	Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	4	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	1	Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	
Perlidae	4	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	5	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	122		
Trichoptera		Culicidae			
Hydropsychidae	80	Muscidae			

MCWQS - 2006 SITE # 28 SITE ID. POCOCR22					
Insecta		Philopotamidae	21	Simuliidae	2
Ephemeroptera		Polycentropodidae	2	Tabanidae	
Baetidae	69	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	2	Poduridae	
Ephemerellidae	3	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	16	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	2	Phryganeidae	1	Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae	1	Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae	1	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	1
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	6	Psephenidae	4	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	1	Gammaridae	
Perlidae	4	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	3	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	89		
Trichoptera		Culicidae			
Hydropsychidae	20	Muscidae			

MCWQS - 2006 SITE # 29 SITE ID. POCOCR14					
Insecta		Philopotamidae		Simuliidae	3
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	42	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae	1	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	12	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	5	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae	1	Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	1
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	1	Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	1	Gammaridae	1
Perlidae	4	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	1
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	87		
Trichoptera		Culicidae			
Hydropsychidae	44	Muscidae			

MCWQS - 2006 SITE # 30 SITE ID. MCMICR21					
Insecta		Philopotamidae	1	Simuliidae	17
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	73	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae	15	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	17	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	11	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	2
Potamanthidae		Uenoidae	1	Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	2	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	2	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	3	Gammaridae	
Perlidae	2	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	96		
Trichoptera		Culicidae			
Hydropsychidae	51	Muscidae			

MCWQS - 2006 SITE # 31 SITE ID. REDRU03					
Insecta		Philopotamidae		Simuliidae	2
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae		Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae	1	Lepidostomatidae	1	Nemertea	
Ephemeridae	3	Helicopsychidae		Nematoda	
Heptageniidae	1	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae	4	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae	3	Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	5	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae	2	Lepidoptera		Mollusca	
Cordulegastridae	1	Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	2
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	1	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae	6	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	1	Corydalidae	3	Gammaridae	6
Perlidae		Sialidae	2	Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	51
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	39		
Trichoptera		Culicidae			
Hydropsychidae	3	Muscidae			

MCWQS - 2006 SITE # 32 SITE ID. HAWKRU01					
Insecta		Philopotamidae	3	Simuliidae	44
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	6	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae		Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae	1	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	14	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	5	Dytiscidae		Sphaeriidae	10
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	9	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	8	Gammaridae	1
Perlidae	3	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	61		
Trichoptera		Culicidae			
Hydropsychidae	23	Muscidae			

MCWQS - 2006 SITE # 33 SITE ID. TROUCR03					
Insecta		Philopotamidae	19	Simuliidae	6
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	2	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	1	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	2	Gammaridae	
Perlidae	3	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	56		
Trichoptera		Culicidae			
Hydropsychidae	264	Muscidae			

MCWQS - 2006 SITE # 34 SITE ID. TOBYCR14					
Insecta		Philopotamidae	5	Simuliidae	
Ephemeroptera		Polycentropodidae	1	Tabanidae	
Baetidae	73	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae	11	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	19	Leptoceridae		Nematomorpha	
Leptophlebiidae	4	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	19	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae	2	Hydroptilidae	4	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	24
Libellulidae	1	Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae	4	Elmidae	27	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	1	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	7	Gammaridae	
Perlidae	15	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae		Arachnidia	
Corixidae	1	Tipulidae	2	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	46		
Trichoptera		Culicidae			
Hydropsychidae	43	Muscidae			

MCWQS - 2006 SITE # 35 SITE ID.TUNKCR03					
Insecta		Philopotamidae	7	Simuliidae	2
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	9	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	1	Poduridae	
Ephemerellidae	1	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	14	Leptoceridae		Nematomorpha	
Leptophlebiidae	2	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	59	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	12	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae	11	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	3	Corydalidae	2	Gammaridae	
Perlidae	20	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae	5	Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae	1	Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	64		
Trichoptera		Culicidae			
Hydropsychidae	46	Muscidae			

MCWQS - 2006 SITE # 36 SITE ID. JONASCR01					
Insecta		Philopotamidae	1	Simuliidae	2
Ephemeroptera		Polycentropodidae	1	Tabanidae	
Baetidae	18	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	2	Poduridae	
Ephemerellidae		Lepidostomatidae	1	Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	2	Leptoceridae		Nematomorpha	
Leptophlebiidae	1	Limnephilidae	1	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	5	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	16	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	4	Psephenidae		Limnaeidae	
Leuctridae	5	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	14	Corydalidae		Gammaridae	
Perlidae		Sialidae		Talitridae	
Perlodidae	4	Neuroptera		Isopoda	
Pteronarcyidae	5	Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	7	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	57		
Trichoptera		Culicidae			
Hydropsychidae	3	Muscidae			

MCWQS - 2006 SITE # 37 SITE ID. POHOCR08					
Insecta		Philopotamidae	67	Simuliidae	34
Ephemeroptera		Polycentropodidae	6	Tabanidae	
Baetidae	139	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	18	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	5	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	3	Turbellaria	
Odonata		Rhyacophilidae	2	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	3	Ancylidae	1
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	1	Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	1	Corydalidae		Gammaridae	2
Perlidae	1	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	5
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae		Arachnidia	
Corixidae	2	Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	82		
Trichoptera		Culicidae			
Hydropsychidae	36	Muscidae			

MCWQS - 2006 SITE # 38 SITE ID. WEIRCR02					
Insecta		Philopotamidae		Simuliidae	2
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	2	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	1	Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	1	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	1
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	3	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	1	Gammaridae	57
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	108
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	23		
Trichoptera		Culicidae			
Hydropsychidae	7	Muscidae			

MCWQS - 2006 SITE # 39 SITE ID. POHOCR06					
Insecta		Philopotamidae	5	Simuliidae	11
Ephemeroptera		Polycentropodidae	1	Tabanidae	
Baetidae	22	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	3	Poduridae	
Ephemerellidae	2	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	5	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	9	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae	1	Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	6	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	41	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	1	Limnaeidae	
Leuctridae	2	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	1	Gammaridae	
Perlidae	3	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae	2	Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae	1	Arachnidia	
Corixidae	1	Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	6		
Trichoptera		Culicidae			
Hydropsychidae	29	Muscidae			

MCWQS - 2006 SITE # 40 SITE ID. BUCKCR01					
Insecta		Philopotamidae	4	Simuliidae	
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	14	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae	2	Lepidostomatidae	1	Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	55	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	32	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	2	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	11	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	3	Psephenidae	4	Limnaeidae	
Leuctridae	2	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	2	Gammaridae	
Perlidae	6	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	74		
Trichoptera		Culicidae			
Hydropsychidae	19	Muscidae			

MCWQS - 2006 SITE # 41 SITE ID. AQUACR09					
Insecta		Philopotamidae	3	Simuliidae	2
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	6	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	1	Poduridae	
Ephemerellidae	5	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	12	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	8	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	7
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae	2	Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae	2	Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	44	Ancylidae	7
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	1	Limnaeidae	
Leuctridae	2	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	2	Gammaridae	
Perlidae	8	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae	1	Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae	1	Arachnidia	
Corixidae		Tipulidae	1	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	49		
Trichoptera		Culicidae			
Hydropsychidae	32	Muscidae			

MCWQS - 2006 SITE # 42 SITE ID. AQUACR10					
Insecta		Philopotamidae		Simuliidae	7
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	11	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	3	Poduridae	
Ephemerellidae	3	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	5	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae	1	Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	4	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	3
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae	1	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	5	Ancylidae	5
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	3	Limnaeidae	
Leuctridae	3	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	4	Gammaridae	
Perlidae	3	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae	1	Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	3	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	24		
Trichoptera		Culicidae			
Hydropsychidae	43	Muscidae			

MCWQS - 2006 SITE # 43 SITE ID. MARSCR08					
Insecta		Philopotamidae	15	Simuliidae	15
Ephemeroptera		Polycentropodidae	1	Tabanidae	
Baetidae	32	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	4	Poduridae	
Ephemerellidae	1	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	7	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae	3	Oligochaeta	
Oligoneuriidae	11	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae	1	Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	7	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae	1	Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	77
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	24	Ancylidae	
Lestidae		Hydraenidae		Physidae	1
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	2	Limnaeidae	
Leuctridae	2	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	4	Gammaridae	
Perlidae	1	Sialidae		Talitridae	7
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	54		
Trichoptera		Culicidae			
Hydropsychidae	14	Muscidae			

MCWQS - 2006 SITE # 44 SITE ID. MARSCR09					
Insecta		Philopotamidae	12	Simuliidae	
Ephemeroptera		Polycentropodidae	2	Tabanidae	
Baetidae	18	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	7	Poduridae	
Ephemerellidae	1	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	22	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	20	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	3
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	3	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae	2	Elmidae	17	Ancylidae	16
Lestidae		Hydraenidae		Physidae	1
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	15	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	4	Gammaridae	
Perlidae	3	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae	1	Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	2
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae	1	Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	33		
Trichoptera		Culicidae			
Hydropsychidae	45	Muscidae			

MCWQS - 2006 SITE # 45 SITE ID. SAMBCR10					
Insecta		Philopotamidae	8	Simuliidae	8
Ephemeroptera		Polycentropodidae	1	Tabanidae	
Baetidae		Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	4	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	3
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	1
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	1	Ancylidae	
Lestidae		Hydraenidae		Physidae	1
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	3	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	
Perlidae	2	Sialidae		Talitridae	26
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	1
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	61		
Trichoptera		Culicidae			
Hydropsychidae	20	Muscidae			

MCWQS - 2006 SITE # 46 SITE ID. BRODCR14					
Insecta		Philopotamidae	4	Simuliidae	12
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	73	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	1	Poduridae	
Ephemerellidae	9	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	28	Leptoceridae		Nematomorpha	
Leptophlebiidae	21	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	24	Phryganeidae		Lumbriculida	1
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae	4	Hydroptilidae	2	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	25	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	2	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	5	Gammaridae	
Perlidae	7	Sialidae		Talitridae	
Perlodidae	2	Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	1
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae	2	Arachnidia	
Corixidae		Tipulidae	1	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	56		
Trichoptera		Culicidae			
Hydropsychidae	46	Muscidae			

MCWQS - 2006 SITE # 47 SITE ID. BRODCR15					
Insecta		Philopotamidae	2	Simuliidae	3
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	55	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	4	Poduridae	
Ephemerellidae	9	Lepidostomatidae	2	Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	24	Leptoceridae		Nematomorpha	
Leptophlebiidae	5	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	13	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae	1	Glossosomatidae		Platyhelminthes	
Tricorythidae	3	Hydroptilidae	6	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	5	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	1	Gammaridae	
Perlidae	1	Sialidae		Talitridae	
Perlodidae	1	Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	66		
Trichoptera		Culicidae			
Hydropsychidae	23	Muscidae			

MCWQS - 2006 SITE # 48 SITE ID. CRANCR01					
Insecta		Philopotamidae	19	Simuliidae	
Ephemeroptera		Polycentropodidae	1	Tabanidae	
Baetidae	1	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	6	Leptoceridae	1	Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	2	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae	2	Lepidoptera		Mollusca	
Cordulegastridae	1	Pyralidae	1	Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae	1	Noteridae		Gastropoda	
Coenagrionidae		Elmidae	6	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	10	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	7
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	1
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	41		
Trichoptera		Culicidae			
Hydropsychidae	137	Muscidae			

MCWQS - 2006 SITE # 49 SITE ID. MCMICR28					
Insecta		Philopotamidae	2	Simuliidae	2
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae		Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	6	Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	5	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	9	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	8
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	1	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	9	Ancylidae	1
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	2
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	4	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	1	Gammaridae	
Perlidae	3	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	44		
Trichoptera		Culicidae			
Hydropsychidae	31	Muscidae			

MCWQS - 2006 SITE # 50 SITE ID. BRODCR01					
Insecta		Philopotamidae	4	Simuliidae	
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	25	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	5	Poduridae	
Ephemerellidae	3	Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	36	Leptoceridae		Nematomorpha	
Leptophlebiidae	3	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	14	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae	1	Platyhelminthes	
Tricorythidae	1	Hydroptilidae	10	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	11	Psephenidae	1	Limnaeidae	
Leuctridae	12	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	1	Corydalidae	2	Gammaridae	
Perlidae	3	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	1
Belostomatidae		Athericidae	1	Arachnidia	
Corixidae		Tipulidae	7	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae	2	Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	77		
Trichoptera		Culicidae			
Hydropsychidae	13	Muscidae			

MCWQS - 2006 SITE # 51 SITE ID. BRODCR12					
Insecta		Philopotamidae	6	Simuliidae	1
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	43	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	6	Poduridae	
Ephemerellidae	4	Lepidostomatidae	2	Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	47	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	15	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	7	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae	1	Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	8	Ancylidae	
Lestidae		Hydraenidae		Physidae	1
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	1	Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	2	Gammaridae	
Perlidae	6	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	1	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	81		
Trichoptera		Culicidae			
Hydropsychidae	59	Muscidae			

MCWQS - 2006 SITE # 52 SITE ID. BUSHCR07					
Insecta		Philopotamidae	8	Simuliidae	6
Ephemeroptera		Polycentropodidae	1	Tabanidae	
Baetidae	68	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae	9	Poduridae	
Ephemerellidae	9	Lepidostomatidae	3	Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	58	Leptoceridae		Nematomorpha	
Leptophlebiidae	7	Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	3
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	15	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	2	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	4
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	12	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	1
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae	1	Psephenidae	10	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae	2	Corydalidae	2	Gammaridae	
Perlidae	13	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae	1	Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	43		
Trichoptera		Culicidae			
Hydropsychidae	74	Muscidae			

MCWQS - 2006 SITE # 53 SITE ID. BRODCR13					
Insecta		Philopotamidae		Simuliidae	48
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	38	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	1	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae	1	Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	4	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	1	Gammaridae	1
Perlidae		Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	174		
Trichoptera		Culicidae			
Hydropsychidae	61	Muscidae			

MCWQS - 2006 SITE # 54 SITE ID. CHERCR11					
Insecta		Philopotamidae	24	Simuliidae	
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	33	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae	1	Brachycentridae	3	Poduridae	
Ephemerellidae	2	Lepidostomatidae	1	Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	13	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	5	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae		Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	3	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	17	Ancylidae	5
Lestidae		Hydraenidae		Physidae	2
Plecoptera		Hydrophilidae		Planorbidae	1
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	10	Limnaeidae	
Leuctridae	1	Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	2	Gammaridae	7
Perlidae	1	Sialidae	1	Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	3	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae	1		
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	66		
Trichoptera		Culicidae			
Hydropsychidae	57	Muscidae			

MCWQS - 2006 SITE # 55 SITE ID. MCMICR30

Insecta		Philopotamidae		Simuliidae	26
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae	31	Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae	1	Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	2	Leptoceridae		Nematomorpha	
Leptophlebiidae		Limnephilidae		Annelida	
Metretopodidae		Molannidae		Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae	5	Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae	4	Glossosomatidae		Platyhelminthes	
Tricorythidae	1	Hydroptilidae		Turbellaria	
Odonata		Rhyacophilidae	1	Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae		Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae		Noteridae		Gastropoda	
Coenagrionidae		Elmidae	4	Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae	1	Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae		Gammaridae	
Perlidae	2	Sialidae		Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae	1	Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	267		
Trichoptera		Culicidae			
Hydropsychidae	23	Muscidae			

MCWQS - 2006 SITE # 56 SITE ID. TUNKCR06					
Insecta		Philopotamidae	8	Simuliidae	17
Ephemeroptera		Polycentropodidae		Tabanidae	
Baetidae		Psychomyiidae		Dixidae	
Baetiscidae		Beraeidae		Collembola	
Caenidae		Brachycentridae		Poduridae	
Ephemerellidae		Lepidostomatidae		Nemertea	
Ephemeridae		Helicopsychidae		Nematoda	
Heptageniidae	32	Leptoceridae		Nematomorpha	
Leptophlebiidae	7	Limnephilidae	1	Annelida	
Metretopodidae		Molannidae	2	Hirudinea	
Neoephemeridae		Odontoceridae		Oligochaeta	
Oligoneuriidae		Phryganeidae		Lumbriculida	
Polymitarcyidae		Sericostomatidae		Lumbriculidae	
Potamanthidae		Uenoidae		Tubificida	
Siphlonuridae	1	Glossosomatidae		Platyhelminthes	
Tricorythidae		Hydroptilidae	1	Turbellaria	
Odonata		Rhyacophilidae		Planariidae	
Aeshnidae		Lepidoptera		Mollusca	
Cordulegastridae		Pyralidae		Bivalva	
Corduliidae		Coleoptera		Unionidae	
Gomphidae		Dytiscidae		Sphaeriidae	
Libellulidae		Gyrinidae	1	Cyrenidae	
Macromiidae		Haliplidae		Corbiculidae	
Calopterygidae	5	Noteridae		Gastropoda	
Coenagrionidae	9	Elmidae		Ancylidae	
Lestidae		Hydraenidae		Physidae	
Plecoptera		Hydrophilidae		Planorbidae	
Capniidae		Limnichidae		Bulimidae	
Chloroperlidae		Psephenidae		Limnaeidae	
Leuctridae		Ptilodactylidae		Crustacea	
Nemouridae		Megaloptera		Amphipoda	
Peltoperlidae		Corydalidae	11	Gammaridae	
Perlidae		Sialidae	2	Talitridae	
Perlodidae		Neuroptera		Isopoda	
Pteronarcyidae		Sisyridae		Asellidae	6
Taeniopterygidae		Diptera		Decapoda	
Hemiptera		Ephydridae		Cambaridae	
Belostomatidae		Athericidae		Arachnidia	
Corixidae		Tipulidae		Acari	
Gerridae		Empididae		Hydrachnidia	
Mesoveliidae		Blephariceridae			
Notonectidae		Ceratopogonidae			
Saldidae		Chaoboridae			
Veliidae		Chironomidae	29		
Trichoptera		Culicidae			
Hydropsychidae	27	Muscidae			

Appendix B:
Surface Water Parameters

SURFACE WATER PARAMETERS

STREAM CLASSIFICATION CODE (TITLE 25, PA CODE)

EV	Exceptional value
HQ-CWF	High Quality Cold Water Fishery
CWF	Cold Water Fishery
MF	Migratory Fishes
TSF	Trout Stocking Fishery

Volume of Flow - Flow is essential in determining the dilution factor for any potential discharge. It is also an indicator of recent weather patterns. Volumes of flow would be higher than normal after a period of heavy precipitation. This is important because during a test period which may occur after heavy rains, the quality of the stream may appear degraded due to non-point source run off. It is also important that the testing period occur during a low flow since pollutants would have the most damaging effect during low flow.

Temperature - Temperature is essential in determining if acceptable standards exist for a particular stream classification. Elevated temperatures from heated water discharges may have a significant ecological effect. It is also important in determining what the direct effect on fish and other aquatic life will be as a result of temperature fluctuation. Maximum temperatures for streams during the month of August are as follows:

CWF and HQ-CWF		18.9 C (66 F)
WWF and HQ-TSF		30.6 C (87 F)
TSF and HQ-WWF	August 1-15	26.7 C (80 F)
	August 16-31	30.6 C (87 F)
EV	Must maintain Existing Quality	

Dissolved Oxygen - Oxygen dissolved in water is measured as D.O. Different levels of D.O. are necessary to support various types of aquatic life. D.O. levels in natural and wastewaters are dependent on the physical, chemical and biochemical activities prevailing in the water body.
Many fishing waters average a D.O. of 9.0 mg/l and above. The minimum daily averages for D.O. are as follows:

CWF	5.0 mg/l
WWF and TSF	4.0 mg/l

pH - Measurement of pH is one of the most important and frequently used tests in water chemistry. The pH value of most natural waters falls within the range of 4 to 9. The pH scale ranges from 0 (acid) to 14 (base). The majority of waters are slightly basic because of the presence of carbonates and bicarbonates. A departure from the normal pH for a particular body of water can be caused by the influx of acid or alkaline industrial wastes (acid deposition in the form of rain or snow). It is a common practice for water treatment plants to adjust the pH. The pH of a solution refers to its hydrogen ion activity. Most fish can tolerate pH values from 5.0 to 9.0, however the best fishing waters fall within the range 6.5 to 8.2.

Specific Conductance - Conductivity is a numerical expression of an aqueous ability to carry an electrical current. It is an indication of the dissolved inorganic solids in the water. The higher the specific conductance, the more impurities are in the water. Freshly distilled water has a conductivity of 0.5 to 2.0 micromhos/cm. The conductivity of the drinking water in the U.S. generally ranges from 50 to 1,500 micromhos/cm.

Total Hardness - Hardness is defined as the total amount of calcium and magnesium salts that are present in the water. Water can be defined by its total hardness as follows:

Soft Water	0 - 60 mg/l
Moderately Hard Water	60 - 120 mg/l
Hard Water	120 - 180 mg/l
Very Hard Water	180 mg/l and up

Total Alkalinity - Alkalinity measures the water's ability to buffer acid. It indicates the water's ability to protect fish and other aquatic life against sudden changes in pH. The best fishing waters are those with alkalinity of 100 - 120 mg/l. The minimum level of total alkalinity for aquatic life is 20 mg/l except where natural conditions are less.

Nitrogen - Nitrate plus nitrite as nitrogen. The maximum recommended level of nitrate plus nitrite for water supply is 10 mg/l as Nitrogen.

Nitrate (NO3) - Nitrate is found only in small amounts in domestic wastewater and is a major ingredient in farm fertilizer. During precipitation, varying amounts of this chemical wash from farmland into nearby waterways. Nitrates stimulate the growth of plankton on water weeds which provide food for fish. This may cause an increase in the fish population, however, if algae grows too quickly, oxygen levels in the water will be reduced and the fish may die.

Nitrite (NO2) - Nitrite is the intermediate stage between nitrate and ammonia. It is relatively short-lived because it is quickly converted to nitrates by bacteria. However, nitrites produce a serious illness in fish even though they don't exist for very long in the environment. Nitrite concentrations in drinking water seldom exceed 0.1 mg/l. It can be expected that levels below 0.2 mg/l are representative of normal conditions.

Ammonia (NH3) - Ammonia is naturally present in surface and ground water and in wastewater. Pure ammonia is strong smelling and colorless. It is manufactured synthetically from nitrogen and hydrogen or it is produced from coal gas. In nature ammonia is formed by the action of bacteria on proteins and urea. Ammonia concentrations of 0.06 mg/l can cause gill damage in fish; 0.1 mg/l may indicate domestic or agricultural wastes and 0.2 mg/l and above is lethal to trout.

Total Phosphorous - Phosphorous occurs in natural waters and waste waters almost solely in the form of phosphate. Phosphates enter waterways from human and animal wastes, phosphate rich rocks, waste from laundries, cleaning and industrial processes and from fertilizer.

Phosphorous is essential to the growth of organisms and it can be the nutrient that limits the productivity of a body of water. If phosphates are present in high concentrations in streams the algae and water weeds grow more rapidly, choking the waterways and using up large amounts of oxygen. The recommended maximum level is 0.1 mg/l for rivers and streams.

Chlorides - Chlorides are salts that contain chlorine and metal. Common chlorides are sodium chloride, calcium chloride and magnesium chloride. Most good fishing waters have a chloride concentration of less than 170 mg/l. The recommended maximum chloride levels are 150 mg/l for special protection waters and 250 mg/l for water supply.

Total Acidity - Acidity can be defined as a solution's ability to neutralize bases. Acidity of water is significant because acids contribute to corrosiveness and influence certain biological processes. Measuring acidity can also reflect changes in the quality of the source water.

Solids - The term solids or residue refers to the matter suspended or dissolved in water. Residue may affect water and effluent quality in many different ways. It can affect the palatability of drinking water or the aesthetic quality of bathing waters. For these reasons wastewater treatment processes remove solids from the discharge.

T.D.S. - Total dissolved solids (T.D.S.), also termed total filterable residue refers to the portion of residue that passes through a filter of a particular size. The maximum recommended value for T.D.S. is 750 mg/l.

T.S.S. - Total suspended solids (T.S.S.), also termed total non-filterable residue refers to the portion of residue that cannot pass through a filter of a particular size.

Fecal Coliform - Coliform bacteria are common in the intestines of both warm and cold-blooded animals and aid in the digestion of food. Some of these coliform bacteria pass out of the body with the stool. Fecal coliform counts of 200/100 mls or less are desirable.

B.O.D. - Biochemical oxygen demand is a parameter measured in the laboratory to determine relative oxygen requirements of wastewaters, effluents and potentially polluted waters. It gives an indication of the amount of biodegradable waste in a water sample.

If water contains a large amount of biodegradable waste, it probably contains numerous bacteria, which utilize oxygen resulting in low D.O. levels. B.O.D. levels indicate the following:

1.0 - 2.0 mg/l	Very clean water
3.0 - 5.0 mg/l	Moderately clean water
5.0 + mg/l	Potential pollution problem

This year, sampling for heavy metals was included at one site. The effects of metals in water and wastewater range from beneficial through troublesome to dangerously toxic. Some metals are essential to plant and animal growth while others may adversely affect water consumers, wastewater treatment systems, and receiving waters. The benefit versus toxicity of some metals depends on their concentrations in waters.

This sampling was added as part of the Pocono Creek Project in response to a lack of data for heavy metals in the Pocono Creek Watershed. The heavy metals descriptions were obtained from the EPA Office of Water web site. The contaminant levels indicated are from the safe drinking water toxicity lists. The following are the parameters which were tested:

Arsenic, Dissolved - Arsenic is an element that occurs naturally in rocks and soil, water, air, plants, and animals. Volcanic activity, the erosion of rocks and minerals, and forest fires are natural sources that can release arsenic into the environment. Although about 90 percent of the arsenic used by industry in the United States is currently used for wood preservative purposes, arsenic is also used in paints, drugs, dyes, soaps, metals and semi-conductors. Agricultural applications, mining, and smelting also contribute to arsenic releases.

Arsenic is nonessential for plants but is an essential trace element in several animal species. Studies have linked long-term exposure to arsenic in drinking water to cancer of the bladder, lungs, skin, kidneys, nasal passages, liver, and prostate. Non-cancer effects of ingesting arsenic include cardiovascular, pulmonary, immunological, neurological, and endocrine (e.g., diabetes) effects. Short-term exposure to high doses of arsenic can cause other adverse health effects, but such effects are unlikely to occur from U.S. public water supplies that are in compliance with the existing arsenic standard of 50 ppb.

Maximum Contaminant Level (MCL) .01 mg/l (proposed for 2001)
Maximum Contaminant Level Goal (MCLG) of zero for arsenic in drinking water.

Cadmium, Dissolved - Cadmium occurs naturally in zinc, lead and copper ores, in coal and other fossil fuels, shales and is released during volcanic action. These deposits can serve as sources to ground and surface waters, especially in contact with soft, acidic waters. Major industrial releases of cadmium are due to waste streams and leaching of landfills, and from a variety of operations that involve cadmium or zinc.

Cadmium is nonessential for plants and animals. It is extremely toxic and accumulates in the kidneys and liver. Cadmium has the potential to cause kidney, liver, bone and blood damage from long-term exposure at levels above the MCL.

MCL: 0.005 mg/l
MCLG: 0.005 mg/l

Copper, Dissolved - Although Copper rarely occurs in source water, the following natural sources have been identified. Copper is widely distributed in nature in the elemental state, in sulfides, arsenites, chlorides, and carbonates. In the sedimentary cycle, copper is concentrated in the clay mineral fractions (sandstones contain 10-40 ppm, shales 30-150 ppm, and marine black shales 20-300 ppm) with a slight enrichment in those clays rich in organic material. Smelting operations and municipal incineration may also produce copper.

Copper is considered an essential trace element for plants and animals. At high doses however it has been shown to cause stomach and intestinal distress, liver and kidney damage, and anemia.

Action Level: 1.3 mg/l
MCLG: 1.3 mg/l

Iron - MCL: 0.3 mg/l as dissolved iron.

Lead, Dissolved - Lead may enter the environment during its mining, ore processing, smelting, refining use, recycling or disposal. It enters water from atmospheric fallout, runoff or wastewater; little is transferred from natural ores.

Lead is nonessential for plants and animals. It is toxic by ingestion and is a cumulative poison which can cause a variety of adverse health effects in humans. At relatively low levels of exposure, these effects may include interference with red blood cell chemistry, delays in normal physical and mental development in babies and young children, slight deficits in the attention span, hearing, and learning abilities of children, and slight increases in the blood pressure of some adults. It appears that some of these effects, particularly changes in the levels of certain blood enzymes and in aspects of children's neurobehavioral development,

may occur at blood lead levels so low as to be essentially without a threshold. Chronic exposure to lead has been linked to cerebrovascular and kidney disease in humans.

Action Level: > 0.015 mg/l in more than 10 percent of tap water samples
MCLG: zero

Nickel, Dissolved - Nickel is found in many ores as sulfides, arsenides, antimonides & oxides or silicates; chief sources include chalcopyrite; others are pyrrhotite, pentlandite, garnierite, niccolite, millerite. The principal natural form of nickel oxide occurs in admixture with nickel sulfides in varying proportions in weathered ore. Nickel carbonate, found as the mineral zaratite, is a potential atmospheric and surface water pollutant.

From 1987 to 1993, according to the Toxics Release Inventory nickel releases to land and water totaled nearly 27 million lbs., of which most was to land. These releases were primarily from nickel smelting/refining and steelworks industries. The largest releases occurred in Oregon and Arkansas. The largest direct releases to water occurred in Maryland and Georgia.

MCL: 0.1 mg/l
MCLG: 0.1 mg/l

Zinc, Dissolved - Zinc has many commercial uses as coatings to prevent rust, in dry cell batteries, and mixed with other metals to make alloys like brass and bronze.

Zinc is an essential growth element for plants and animals. Too little zinc can cause health problems, but at elevated levels it is can also be harmful. At high doses it can cause anemia and pancreas damage.

MCL: 5 mg/l

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	PARACR03	BUTZRU01	CRCRPA01	DEHOCR04
Date	8/7/06	8/7/06	8/7/06	8/7/06
Time	0830	0915	1000	1030
Stream Name	Paradise Creek	Butz Run	Cranberry Creek	Devils Hole Creek
Weather	Overcast	Sun	Overcast	Sun
Volume of Flow (cfs)	38.32	0.22	3.25	8.50
Stream Temperature (^{O}C)	20.7	18.3	20.1	16.9
Dissolved Oxygen	9.69	8.73	8.35	9.13
pH	Field / Lab 7.5 7.09	Field / Lab 7.8 7.07	Field / Lab 7.7 6.82	Field / Lab 7.7 6.72
Conductivity µs/cm	243.0	191.3	155.8	87.7
Total Hardness	30.0	33.0	26.0	16.0
Total Alkalinity	16.5	21.0	12.5	7.00
Nitrate+Nitrite as N	0.207	0.289	0.129	0.309
Nitrate NO_3	0.207	0.289	0.129	ND
Nitrite NO_2	ND	ND	ND	ND
Ammonia NH_3	ND	ND	ND	ND
Total Phosphorus	ND	ND	ND	ND
Chlorides	26.9	14.2	12.9	6.56
Total Acidity	6.00	3.50	3.50	4.00
T.D.S.	121	95.8	78.8	43.9
T.S.S.	ND	ND	ND	ND
Fecal Coliform	30 EST.	<10 EST.	50 EST.	60 EST.

ND - None Detected

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	PARACR04	INDIRU01	FOHIRU01	SWIFCR06
Date	8/7/06	8/7/06	8/8/06	8/8/06
Time	1115	1145	0830	0845
Stream Name	Paradise Creek	Indian Run	Forest Hills Run	Swiftwater Creek
Weather	Clear	Clear	Clear	Clear
Volume of Flow (cfs)	2.51	0.96	3.04	16.18
Stream Temperature (^{O}C)	17.2	10.1	20.7	21.2
Dissolved Oxygen	10.19	10.24	8.66	7.73
pH	Field / Lab 7.4 6.73	Field / Lab 5.6 ---	Field / Lab 7.4 7.19	Field / Lab 7.5 7.28
Conductivity µs/cm	328	370	380	325
Total Hardness	39.0	---	50.0	32.0
Total Alkalinity	9.00	---	28.0	21.0
Nitrate+Nitrite as N	0.542	---	0.457	0.158
Nitrate NO_3	0.5420	---	0.457	0.158
Nitrite NO_2	ND	---	ND	ND
Ammonia NH_3	ND	---	ND	ND
Total Phosphorus	ND	---	ND	ND
Chlorides	45.7	---	41.1	39.9
Total Acidity	4.00	---	3.00	3.50
T.D.S.	166	186	191	165
T.S.S.	ND	---	ND	2.80
Fecal Coliform	<10 EST.	---	30 EST.	<10 EST.

ND - None Detected

Sites that are tested annually and which consistently show good water quality did not have chemical samples taken for laboratory analysis.

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	SWIFCR02	PARACR01	FOHIRU09	FOHIRU06
Date	8/8/06	8/8/06	8/8/06	8/8/06
Time	0915	0945	1030	1100
Stream Name	Swiftwater Creek	Paradise Creek	Forest Hills Run	Forest Hills Run
Weather	Clear	Clear	Clear	Clear
Volume of Flow (cfs)	19.13	19.61	4.27	1.95
Stream Temperature (^{O}C)	21.2	20.1	22.5	17.8
Dissolved Oxygen	7.88	8.18	7.77	9.75
pH	Field / Lab 7.5 7.27	Field / Lab 7.5 7.32	Field / Lab 7.4 7.32	Field / Lab 7.5 7.40
Conductivity µs/cm	340.0	183.6	444.0	539.0
Total Hardness	36.0	26.0	56.0	60.0
Total Alkalinity	22.5	12.0	33.0	30.0
Nitrate+Nitrite as N	0.226	0.317	0.273	0.884
Nitrate NO_3	0.226	0.311	0.261	0.884
Nitrite NO_2	ND	0.006	0.012	ND
Ammonia NH_3	ND	ND	0.056	ND
Total Phosphorus	ND	ND	ND	ND
Chlorides	40.8	18.8	48.6	65.2
Total Acidity	3.50	3.50	5.00	3.50
T.D.S.	170	92.0	224	270
T.S.S.	ND	ND	8.00	ND
Fecal Coliform	10 EST.	30 EST.	60 EST	220 EST.

ND - None Detected

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	LEHIRI01	LEHIRI02	TOBYCR01	SWIFCR07
Date	8/9/06	8/9/06	8/9/06	8/9/06
Time	0830	0915	1000	1030
Stream Name	Lehigh River	Lehigh River	Tobyhanna Creek	Swiftwater Creek
Weather	Sun	Sun	Sun	Sun
Volume of Flow (cfs)	46.63	35.51	15.24	5.57
Stream Temperature (^{O}C)	16.7	16.5	19.6	13.5
Dissolved Oxygen	6.43	6.16	7.54	12.64
pH	Field / Lab 6.8 7.01	Field / Lab 6.9 7.03	Field / Lab 7.1 ---	Field / Lab 7.3 ---
Conductivity µs/cm	120.5	124.1	227.0	160.9
Total Hardness	19.0	20.0	---	---
Total Alkalinity	8.50	8.50	---	---
Nitrate+Nitrite as N	0.098	0.170	---	---
Nitrate NO_3	0.098	0.170	---	---
Nitrite NO_2	ND	ND	---	---
Ammonia NH_3	ND	ND	---	---
Total Phosphorus	ND	ND	---	---
Chlorides	11.3	11.7	---	---
Total Acidity	4.00	4.00	---	---
T.D.S.	60.3	62.2	114	80.5
T.S.S.	2.00	ND	---	---
Fecal Coliform	30 EST.	30 EST.	---	---

ND - None Detected

Sites that are tested annually and which consistently show good water quality did not have chemical samples taken for laboratory analysis.

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	SWIFCR05	SWIFCR03	CRCRPA03	DRSARU01
Date	8/9/06	8/9/06	8/10/06	8/10/06
Time	1200	1230	0830	0930
Stream Name	Swiftwater Creek	Swiftwater Creek	Cranberry Creek	Dry Sawmill Run
Weather	Clear	Clear	Clear	Clear
Volume of Flow (cfs)	7.92	10.50	0.58	1.72
Stream Temperature (^{O}C)	17.3	16.0	16.3	15.7
Dissolved Oxygen	9.12	9.72	8.56	8.74
pH	Field / Lab 7.3 7.25	Field / Lab 7.3 7.09	Field / Lab 7.1 7.32	Field / Lab 7.3 7.29
Conductivity µs/cm	325.0	168.6	362.0	194.0
Total Hardness	30.0	25.0	48.0	21.0
Total Alkalinity	20.5	8.00	25.5	9.00
Nitrate+Nitrite as N	0.463	0.386	0.478	0.198
Nitrate NO_3	0.463	0.386	0.478	0.198
Nitrite NO_2	ND	ND	ND	ND
Ammonia NH_3	ND	ND	ND	ND
Total Phosphorus	ND	ND	ND	ND
Chlorides	39.9	26.8	36.3	23.6
Total Acidity	3.00	3.00	4.00	3.50
T.D.S.	162	84.2	180	97.0
T.S.S.	ND	ND	ND	ND
Fecal Coliform	<10 EST.	<10 EST	20 EST.	<10 EST.

ND - None Detected

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	POCOCR20	POCOCR16	POCOCR17	POCOCR19
Date	8/10/06	8/10/06	8/10/06	8/10/06
Time	1015	1100	1130	1200
Stream Name	Pocono Creek	Pocono Creek	Pocono Creek	Pocono Creek
Weather	Clear	Overcast	Clear	Clear
Volume of Flow (cfs)	14.57	10.53	10.52	9.18
Stream Temperature (^{O}C)	15.3	16.4	17.3	18.4
Dissolved Oxygen	11.85	10.91	10.10	9.54
pH	Field / Lab 7.4 7.3	Field / Lab 7.3 7.23	Field / Lab 7.3 7.28	Field / Lab 7.3 7.31
Conductivity µs/cm	103.1	158.6	207.2	230.0
Total Hardness	15.0	22.0	28.0	35.0
Total Alkalinity	8.50	12.50	15.50	18.0
Nitrate+Nitrite as N	0.064	0.201	0.383	0.464
Nitrate NO_3	0.064	0.201	0.383	0.464
Nitrite NO_2	ND	ND	ND	ND
Ammonia NH_3	ND	0.118	ND	ND
Total Phosphorus	ND	ND	ND	ND
Chlorides	11.3	16.3	23.4	29.4
Total Acidity	3.00	3.50	3.00	3.00
T.D.S.	51.20	79.30	103.1	115.0
T.S.S.	ND	ND	ND	ND
Fecal Coliform	10 EST.	10 EST.	80 EST.	30 EST.

ND - None Detected

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	SCOTCR04	POCOCR15	POCOCR18	POCOCR22
Date	8/11/06	8/11/06	8/11/06	8/11/06
Time	0800	0830	0900	0945
Stream Name	Scotrun Creek	Pocono Creek	Pocono Creek	Pocono Creek
Weather	Clear	Clear	Cloudy	Clear
Volume of Flow (cfs)	1.55	14.34	17.92	28.44
Stream Temperature (^{O}C)	17.5	18.1	18.5	18.0
Dissolved Oxygen	7.83	9.34	9.55	9.24
pH	Field / Lab 6.8 7.29	Field / Lab 7.3 7.51	Field / Lab 7.7 7.64	Field / Lab 7.6 7.47
Conductivity µs/cm	314	345	358	357
Total Hardness	51.0	44.0	47.0	47.0
Total Alkalinity	29.5	25.5	27.0	27.5
Nitrate+Nitrite as N	0.253	0.524	0.453	0.518
Nitrate NO_3	0.253	0.524	0.453	0.518
Nitrite NO_2	ND	ND	ND	ND
Ammonia NH_3	ND	ND	ND	ND
Total Phosphorus	ND	ND	ND	ND
Chlorides	43.2	37.9	38.3	39.0
Total Acidity	5.00	3.00	2.50	3.50
T.D.S.	156	179	179	166
T.S.S.	ND	ND	ND	ND
Fecal Coliform	60 EST.	340 EST	50 EST.	50 EST.

ND - None Detected

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	POCOCR14	MCMICR21	REDRU03	HAWKRU02
Date	8/11/06	8/11/06	8/14/06	8/14/06
Time	1045	1110	0800	0845
Stream Name	Pocono Creek	McMichael Creek	Red Run	Hawkey Run
Weather	Clear	Clear	Clear	Clear
Volume of Flow (cfs)	20.48	78.04	0	2.83
Stream Temperature (^{O}C)	20.2	20.4	11.7	15.1
Dissolved Oxygen	8.85	8.65	8.68	9.23
pH	Field / Lab 7.7 7.67	Field / Lab 7.7 ---	Field / Lab 6.9 ---	Field / Lab 6.7 6.87
Conductivity µs/cm	447	360	207	195
Total Hardness	63.0	---	---	24.0
Total Alkalinity	36.0	---	---	7.00
Nitrate+Nitrite as N	0.553	---	---	0.387
Nitrate NO_3	0.553	---	---	0.387
Nitrite NO_2	ND	---	---	ND
Ammonia NH_3	ND	---	---	ND
Total Phosphorus	ND	---	---	ND
Chlorides	45.4		---	26.2
Total Acidity	2.50	---	---	4.00
T.D.S.	225	182	104	97.2
T.S.S.	ND	---	---	ND
Fecal Coliform	30 EST.	---	---	40 EST.

ND - None Detected

Sites that are tested annually and which consistently show good water quality did not have chemical samples taken for laboratory analysis.

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	TROUCR03	TOBYCR14	TUNKCR03	JONASCR01
Date	8/14/06	8/14/06	8/14/06	8/14/06
Time	0930	1030	1100	1130
Stream Name	Trout Creek	Tobyhanna Creek	Tunkhannock Creek	Jonas Creek
Weather	Clear	Clear	Clear	Clear
Volume of Flow (cfs)	3.93	16.71	23.69	3.83
Stream Temperature (^{O}C)	21.0	18.0	16.1	12.7
Dissolved Oxygen	8.07	9.64	10.10	11.28
pH	Field / Lab 6.9 ---	Field / Lab 7.0 6.94	Field / Lab 6.5 ---	Field / Lab 6.7 6.76
Conductivity µs/cm	101.4	136.5	81.5	78.2
Total Hardness	---	18.0	---	11.0
Total Alkalinity	---	8.00	---	4.00
Nitrate+Nitrite as N	---	0.138	---	0.280
Nitrate NO_3	---	0.138	---	0.280
Nitrite NO_2	---	ND	---	ND
Ammonia NH_3	---	ND	---	ND
Total Phosphorus	---	ND	---	ND
Chlorides	---	15.6	---	7.98
Total Acidity	---	3.00	---	4.00
T.D.S.	47	68.4	40.8	39.2
T.S.S.	---	ND	---	ND
Fecal Coliform	---	10 EST.	---	<10 EST.

ND - None Detected

Sites that are tested annually and which consistently show good water quality did not have chemical samples taken for laboratory analysis.

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	POHOCR08	WEIRCR02	POHOCR06	BUCKCR01
Date	8/15/05	8/15/06	8/15/06	8/16/06
Time	1245	0900	0930	1100
Stream Name	Pohopoco Creek	Weir Creek	Pohopoco Creek	Buckwha Creek
Weather	Rain	Overcast	Overcast	Overcast
Volume of Flow (cfs)	15.68	10.75	51.86	12.46
Stream Temperature (^{O}C)	18.7	17.0	18.2	18.8
Dissolved Oxygen	8.32	6.43	8.63	7.78
pH	Field / Lab 7.0 6.77	Field / Lab 6.3 6.37	Field / Lab 6.9 ---	Field / Lab 7.2 7.11
Conductivity µs/cm	162.3	238	142.0	169.0
Total Hardness	27.0	39.0	---	38.0
Total Alkalinity	12.0	11.0	---	24.0
Nitrate+Nitrite as N	0.900	2.22	---	0.794
Nitrate NO_3	0.878	2.21	---	0.788
Nitrite NO_2	0.022	0.0070	---	0.006
Ammonia NH_3	0.059	ND	---	ND
Total Phosphorus	0.071	ND	---	ND
Chlorides	15.6	20.6	---	8.51
Total Acidity	3.50	14.5	---	3.50
T.D.S.	81.2	120	70.8	84.5
T.S.S.	10.4	5.20	---	7.60
Fecal Coliform	13,000	1,100	---	1,200

ND - None Detected

Sites that are tested annually and which consistently show good water quality did not have chemical samples taken for laboratory analysis.

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	AQUACR09	AQUACR10	MARSCR08	MARSCR09
Date	8/15/06	8/15/06	8/16/06	8/16/06
Time	1200	1230	0815	0845
Stream Name	Aquashicola Creek	Aquashicola Creek	Marshalls Creek	Marshalls Creek
Weather	Cloudy	Cloudy	Clear	Clear
Volume of Flow (cfs)	18.25	18.96	10.49	10.82
Stream Temperature (^{O}C)	18.5	18.7	18.9	19.2
Dissolved Oxygen	9.05	8.99	6.92	8.20
pH	Field / Lab 7.7 ---	Field / Lab 7.9 7.60	Field / Lab 7.0 ---	Field / Lab 7.5 ---
Conductivity µs/cm	277	245	208	269
Total Hardness	---	67.0	---	---
Total Alkalinity	---	54.0	---	---
Nitrate+Nitrite as N	---	0.371	---	---
Nitrate NO_3	---	0.371	---	---
Nitrite NO_2	---	ND	---	---
Ammonia NH_3	---	ND	---	---
Total Phosphorus	---	ND	---	--
Chlorides	---	6.56	---	---
Total Acidity	---	2.00	---	--
T.D.S.	140	124	104	136
T.S.S.	---	2.00	---	---
Fecal Coliform	---	980 EST.	---	---

ND - None Detected

Sites that are tested annually and which consistently show good water quality did not have chemical samples taken for laboratory analysis.

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	SAMBCR10	BRODCR14	BRODCR15	CRANCR01
Date	8/16/06	8/16/06	8/16/06	8/16/06
Time	0900	0930	1015	1045
Stream Name	Sambo Creek	Brodhead Creek	Brodhead Creek	Cranberry Creek
Weather	Clear	Clear	Clear	Clear
Volume of Flow (cfs)	4.18	66.78	67.68	0.82
Stream Temperature (^{O}C)	18.4	19.4	20.2	17.7
Dissolved Oxygen	8.50	8.52	9.98	8.74
pH	Field / Lab 7.7 ---	Field / Lab 7.4 7.08	Field / Lab 7.3 7.18	Field / Lab 7.3 7.36
Conductivity µs/cm	461	195.8	197	738
Total Hardness	---	28.0	28.0	103
Total Alkalinity	---	15.5	16.0	57.0
Nitrate+Nitrite as N	---	0.234	0.238	7.23
Nitrate NO_3	---	0.234	0.238	7.23
Nitrite NO_2	---	ND	ND	ND
Ammonia NH_3	---	ND	ND	ND
Total Phosphorus	---	ND	ND	1.71
Chlorides	---	18.6	18.8	54.6
Total Acidity	---	4.50	5.50	5.00
T.D.S.	233	97.9	98.6	370
T.S.S.	---	ND	ND	ND
Fecal Coliform	---	20 EST.	20 EST.	60 EST.

ND - None Detected

Sites that are tested annually and which consistently show good water quality did not have chemical samples taken for laboratory analysis.

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	MCMICR28	BRODCR01	BRODCR12	BUSHCR07
Date	8/16/06	8/17/06	8/17/06	8/17/06
Time	1145	0815	0845	0945
Stream Name	McMichael Creek	Brodhead Creek	Brodhead Creek	Bushkill Creek
Weather	Clear	Clear	Clear	Cloudy
Volume of Flow (cfs)	34.57	20.42	56.04	56.56
Stream Temperature (^{O}C)	19.6	18.5	18.5	19.1
Dissolved Oxygen	11.65	11.50	11.75	10.95
pH	Field / Lab 8.2 7.56	Field / Lab 7.2 ---	Field / Lab 7.3 ---	Field / Lab 7.2 ---
Conductivity µs/cm	222	121.5	190	115.4
Total Hardness	45.0	---	---	---
Total Alkalinity	28.5	---	---	---
Nitrate+Nitrite as N	0.307	---	---	---
Nitrate NO_3	0.302	---	---	---
Nitrite NO_2	0.005	---	---	---
Ammonia NH_3	ND	---	---	---
Total Phosphorus	ND	---	---	---
Chlorides	13.5	---	---	---
Total Acidity	4.00	---	---	---
T.D.S.	112	60.9	95.2	57.9
T.S.S.	3.20	---	---	---
Fecal Coliform	230 EST.	---	---	---

ND - None Detected

Sites that are tested annually and which consistently show good water quality did not have chemical samples taken for laboratory analysis.

SURFACE WATER TEST SITES
PHYSICAL/CHEMICAL DATA

Site ID	BRODCR13	CHERCR11	MCMICR30	TUNKCR06
Date	8/17/06	8/17/06	8/17/06	9/6/06
Time	1030	1130	1200	1130
Stream Name	Brodhead Creek	Cherry Creek	McMichael Creek	Tunkhannock Creek
Weather	Clear	Clear	Clear	Clear
Volume of Flow (cfs)	120.15	20.52	83.75	**
Stream Temperature (^{O}C)	20.6	18.8	21.1	16.3
Dissolved Oxygen	12.22	11.98	11.78	7.04
pH	Field / Lab 7.9 ---	Field / Lab 8.1 ---	Field / Lab 7.9 7.56	Field / Lab 5.3 ---
Conductivity µs/cm	325	492	438	77.3
Total Hardness	---	---	64.0	---
Total Alkalinity	---	---	46.5	---
Nitrate+Nitrite as N	---	---	1.11	---
Nitrate NO_3	---	---	1.02	---
Nitrite NO_2	---	---	0.091	---
Ammonia NH_3	---	---	0.260	---
Total Phosphorus	---	---	1.10	---
Chlorides	---	---	35.1	---
Total Acidity	---	---	4.00	---
T.D.S.	163	248	220	38.8
T.S.S.	---	---	ND	---
Fecal Coliform	---	---	40 EST.	---

** - No Flow taken

ND - None Detected

Sites that are tested annually and which consistently show good water quality did not have chemical samples taken for laboratory analysis.

SURFACE WATER TEST SITES
CHEMICAL DATA
(HEAVY METALS)

Site #	POCOCR22
Date	8/11/06
Time	0945
Stream Name	Pocono Creek
Iron	0.014
Nickel, Dissolved	0.003
Copper, Dissolved	ND
Cadmium, Dissolved	ND
Arsenic, Dissolved	ND
Lead, Dissolved	ND
Zinc, Dissolved	0.016

ND - None Detected

Appendix C:
Habitat Analysis

HABITAT ANALYSIS

Both the quality and quantity of available habitat affects the macroinvertebrate community. A healthy biological community not only requires good water quality, but also a supporting habitat. The effect of habitat can be minimized by sampling in areas where habitats are similar. This way, impacts to the biological community can be attributed to water quality.

When sampling station habitats are not comparable, it is important to consider the differences when interpreting the bio-survey results.

Beginning with the 1993 study, each sampling station's habitat has been rated. There are two types of rating systems. One is for a riffle/run prevalent stream, like most of the streams in Monroe County. The other is for glide/pool prevalence. Only a few stations in this study were rated using the latter system. The rating system incorporates three categories for a total of twelve parameters. The following is an explanation of the habitat parameters:

Habitat Parameter Descriptions

RIFFLE/RUN COMMUNITY

Substrate/Instream Cover

1. **Instream Cover:**
   This is a measure of quantity and variety of natural structures in the stream that will provide a habitat for fish. This would include fallen trees, logs, and branches, undercut banks and large rocks. A wide variety of substrate will support greater diversity.

2. **Substrate for Benthic Macroinvertebrates:**
   This measures the amount of hard substrate available for insects and snail habitat. Many insect larvae attach themselves to submerged substrate. Areas with rocky bottoms are critical for maintaining a healthy variety of insects.

3. **Embeddedness:**
   This refers to the degree to which rocks are covered or sunken into the silt, sand or mud. As substrate becomes embedded in the stream bottom, the amount of surface space for insects to attach themselves decreases. As substrate becomes embedded, the quantity and quality of the macroinvertebrate community will decrease.

4. **Velocity/Depth Regime:**
   There are four basic velocity/depth combinations:
   (1) Slow-deep
   (2) Slow-shallow
   (3) Fast-deep
   (4) Fast-shallow
   General guidelines are as follows: 0.5m separates deep from shallow: 0.3m/s separates fast from slow. Streams that contain all four regimes are considered optimal.

Channel Morphology (form and structure)

5. **Channel Alteration:**
This parameter is a measure of changes to the shape of the stream channel. Streams that run through agricultural or urban areas may have been altered many times. When streams have been changed in any way (i.e., straightened, deepened, diverted, concrete channelized, artificial embankments or stabilization, dams or bridges) it can affect the macroinvertebrate community. Streams that have been altered have fewer natural habitats for fish, macroinvertebrates and plants.

6. **Sediment Deposition:**
This parameter measures the sediment, which has accumulated on the stream bottom as a result of deposition. Deposition occurs as a result of large-scale movement of sediment caused by watershed erosion. This deposition may cause the formation of islands or point bars in the stream, which decreases the available habitat for macroinvertebrates.

7. **Frequency of Riffles:**
This parameter assumes that a stream with riffles or bends provides more diverse habitat than any straight or uniform depth stream. The ratio is calculated by dividing the average distance between riffles or bends by the average depth. The smaller ratio is an indicator of good habitat.

8. **Channel Flow Status:**
This is a measure of the degree to which the channel is filled with water. When the water reaches the base of both banks and a minimal amount of channel substrate is exposed, optimal conditions exist.

Riparian and Bank Structures

9. **Condition of Banks:**
This parameter addresses stream bank erosion (or potential for erosion). Steep banks are generally more subject to erosion and failure. Signs of erosion include crumbling and unvegetated banks and exposed tree roots and soil.

10. **Bank Vegetative Protection:**
This measures the amount of stream bank, which is covered by vegetation. Plant root systems on stream banks help to hold the soil in place. This reduces the stream bank erosion. This parameter also provides information such as stream shading and nutrient uptake. Banks with full natural plant growth are better for macroinvertebrates and fish.

11. **Grazing Disruptive Pressure:**
This parameter measures the impact to the riparian zone due to livestock grazing or human activities such as urbanization, golf courses and residential development.

12. **Riparian Zone Width:**
This is a measure of the width of the natural vegetation from the edge of the stream bank. This zone serves as a buffer to pollutants entering the stream from run off and erosion. It also provides nutrients to the stream. An undisturbed riparian zone is reflective of a healthy stream, while a narrow riparian zone is not as healthy for a stream. Roads, parking lots, fields, lawns, rocks, bare soil or buildings near a stream bank have a detrimental effect on habitat.

GLIDE/POOL COMMUNITY

Substrate/Instream Cover

1. **Instream cover:**
   This is a measure of quantity and variety of natural structures of the stream that provides a habitat for fish. This would include fallen trees, logs and branches, undercut banks, and large rocks. A wide variety of substrate will support greater diversity.

2. **Substrate for Macroinvertebrates:**
   The substrate in muddy bottom streams consists mostly of submerged logs, snags and aquatic vegetation.

3. **Pool Substrate Composition:**
   This is an evaluation of the type and condition of bottom substrates found in pools. Firm sediment types such as gravel and sand as well as rooted aquatic plants support a wider variety of organisms. A pool substrate dominated by mud or bedrock will not support a diverse community. A variety of substrate is needed for a diverse community.

4. **Pool Variability:**
   This parameter rates the overall mixture of pool types found in the streams. The four basic types of pools are:
   (1) Large-shallow
   (2) Large-deep
   (3) Small-shallow
   (4) Small-deep
   General guidelines are as follows: greater than one half the cross-section to separate large from small and one meter separating shallow and deep.

Channel Morphology (form and structure)

5. **Channel Alteration:**
   This parameter is a measure of changes to the shape of the stream channel. Streams that run through agricultural or urban areas may have been altered many times. When streams have been changed in any way (i.e., straightened, deepened, diverted, concrete channelized, artificial embankments or stabilization, dams or bridges) it can affect the macroinvertebrate community. Streams that have been altered have fewer natural habitats for fish, macroinvertebrates and plants.

6. **Sediment Deposition:**
   This parameter measures the sediment, which has accumulated on the bottom as a result of deposition. Deposition occurs as a result of large-scale movement of sediment caused by watershed erosion. This deposition may cause the formation of islands or point bars in the stream, which decreases the available habitat for macroinvertebrates.

7. **Channel Sinuosity:**
   This is an evaluation of the frequency of bends in a stream. Streams that meander provide a variety of habitat for macroinvertebrates. Straight stream segments provide for monotonous habitats and are prone to flooding. The bends in the stream also protect the banks from erosion.

8. **Channel Flow Status:**
   This is a determination of the percent of the channel that is filled with water. The flow status changes as the channel enlarges or as flow is decreased as a result of dams or obstructions, diversions for irrigation, or drought. When water does not cover as much of the streambed the available habitat is decreased.

Riparian and Bank Structure

9. **Condition of Bank:**
   Refer to riffle/run definition.

10. **Bank Vegetative Protection:**
    Refer to riffle/run definition.

11. **Grazing Disruptive Pressure:**
    Refer to riffle/run definition.

12. **Riparian Vegetative Zone Width:**
    Refer to riffle/run definition.

Each sampling station's habitat is rated using the previously discussed parameters. Each parameter is scored from 0-20 as follows:

Score	Category
0-5	Poor
6-10	Marginal
11-15	Suboptimal
16-20	Optimal

Each parameter is added for a final habitat score for a particular station.

Score	Category
0-60	Poor
72-120	Marginal
132-180	Suboptimal
192-240	Optimal

The habitat is a major factor in determining the potential of the aquatic community. A marginal or poor habitat is not expected to support the quantity and quality of macroinvertebrates that an optimal habitat will.

Similar streams may have differing aquatic communities due to differing habitat. The effect of habitat can be minimized by sampling in areas where habitats are similar. In these areas, the impacts on the aquatic community can be attributed to water quality.

HABITAT RESULTS

Site Number	Score	Category	Influences
PARACR03	192	Optimal	Well developed riffle and run. All four velocity/depth regimes present. Riparian vegetation width impacted due to highway. Streambanks moderately stable.
BUTZRU01	150	Suboptimal	Unstable banks, apparent landslide. Moderate deposition of new gravel. Only 2 of the 4 velocity/depth regimes present.
CRCRPA01	185	Suboptimal-Optimal	Only 3 of the 4 velocity/depth regimes present. Streambank moderately stable.
DEHOCR04	176	Suboptimal	Gravel, cobble and boulder particles are 25-50% surrounded by fine sediment. Only 3 of the 4 velocity/depth regimes present. Width of riparian zone 6 - 12 meters.
PARACR04	191	Optimal	Occurrence of riffles relatively frequent. Water reaches both lower banks with minimal amount of channel substrate exposed. Width of riparian zone 6 - 12 meters.
INDIRU01	200	Optimal	Greater than 50% mix of boulder, cobble, or other stable habitat. Well developed riffle and run. Only 3 of the 4 velocity/depth regimes present. Width of riparian zone > 18 meters.
FOHIRU01	168	Suboptimal	Some channelized areas present, new island bar formation. 70 – 90% of streambank surfaces vegetated. Condition of banks moderately stable.
SWIFCR06	195	Optimal	Greater than 50% mix of boulder, cobble, submerged logs or other stable habitat. Occurrence of riffles relatively frequent. Width of riparian zone 12 - 18 meters.
SWIFCR02	170	Suboptimal	Streambanks moderately unstable, new embankments. Width of riparian zone 6 - 12 meters.

Site Number	Score	Category	Influences
PARACR01	179	Suboptimal	Greater than 50% mix of boulder, cobble, submerged logs or other stable habitat. Streambank stable with small areas of erosion. Width of riparian zone 12 - 18 meters.
FOHIRU09	173	Suboptimal	Streambank moderately stable with small areas of erosion. Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. Only 3 of the 4 velocity/depth regimes present.
FOHIRU06	173	Suboptimal	Well developed riffle and run. Grazing or other disruptive pressure evident but not affecting full plant growth potential to any great extent. Width of riparian zone < 6 meters.
LEHIRI01	215	Optimal	Greater than 50% mix of boulder, cobble, submerged logs or other stable habitat. Well developed riffle and run. All four velocity/depth regimes present. Water reaches base of both lower banks.
LEHIRI02	185	Suboptimal-Optimal	All four velocity/depth regimes present. Little or no enlargement of islands or point bars. Water reaches base of both lower banks.
TOBYCR01	192	Optimal	Well developed riffle and run. 90% of streambank covered by vegetation. Banks stable; no evidence of erosion or bank failure. Width of riparian zone 12 - 18 meters.
SWIFCR07	192	Optimal	Greater than 50% mix of boulder, cobble, submerged logs or other stable habitat. All four velocity/depth regimes present. Vegetative disruption minimal; riparian zone >18 meters.
SWIFCR05	188	Suboptimal-Optimal	Occurrence of riffles relatively frequent All four velocity/depth regimes present. Width of riparian zone 12-18 meters.
SWIFCR03	183	Suboptimal-Optimal	Excellent mix of boulder, cobble, submerged logs, undercut banks or other stable habitat. Disruption of streambank vegetation is obvious. Width of riparian zone < 6 meters.

Site Number	Score	Category	Influences
CRCRPA03	193	Optimal	Occurrence of riffles relatively frequent. Riparian zone >18 meters with minimal vegetation disruption. No channelization or dredging present.
DRSARU01	199	Optimal	Greater than 50% mix of boulder, cobble, submerged logs or other stable habitat. Occurrence of riffles relatively frequent. Width of riparian zone >18 meters.
POCOCR20	199	Optimal	Occurrence of riffles relatively frequent. < 25% of channel substrate exposed. Width of riparian zone >18 meters.
POCOCR16	151	Suboptimal	New embankments present on both banks and 40- 80% of stream reach channelized and disrupted. Width of riparian zone 6 - 12 meters.
POCOCR17	177	Suboptimal	New increase in bar formation. < 25% of channel substrate exposed. Gravel, cobble, and boulder particles are 25 – 50% surrounded by fine sediment. Width of riparian zone 6 – 12meters.
POCOCR19	144	Suboptimal	Some new increase in bar formation. Only 3 of the 4 velocity/depth regimes present. 50 - 70% of the streambank surfaces covered by vegetation. Width of riparian zone <6 meters.
SCOTCR04	150	Suboptimal	Water reaches both lower banks with minimal amount of substrate exposed. 70 - 90% of the streambank surfaces covered by vegetation. Width of riparian zone 12 - 18 meters.
POCOCR15	170	Suboptimal	Greater than 50% mix of boulder, cobble, submerged logs or other stable habitat. Gravel, cobble, and boulder particles are 0– 25% surrounded by fine sediment.
POCOCR18	175	Suboptimal	Streambank moderately stable with small areas of erosion. 70 - 90% of the streambank surfaces covered by vegetation.

Site Number	Score	Category	Influences
POCOCR22	187	Suboptimal-Optimal	Well developed riffle and run. Width of riparian zone > 18 meters.
POCOCR14	158	Suboptimal	30 - 50% mix of boulder, cobble, or other stable habitat. Water fills 25 – 75% of available channel. Width of riparian zone 12 - 18 meters.
MCMICR21	134	Suboptimal	New embankments present on both banks; 40 to 80% of stream reach channelized and disrupted. Gravel, cobble, and boulder particles are 50 – 75% surrounded by fine sediment.
REDRU03	166	Suboptimal	Glide/Pool prevalence. Shallow pools much more prevalent than deep pools. Banks stable, more then 90% of streambank surfaces covered by vegetation.
HAWKRU02	203	Optimal	Banks stable; 90% of streambank surfaces covered by vegetation. Little or no enlargement of islands or point bars; water reaches both lower banks.
TROUCR03	189	Suboptimal-Optimal	Greater than 50% mix of boulder, cobble, or other stable habitat Occurrence of riffles relatively frequent. Water fills >75% of available channel.
TOBYCR14	177	Suboptimal	Greater than 50% mix of boulder, cobble, undercut banks, or other stable habitat. Evidence of past channelization present. Width of riparian zone 12 – 18 meters.
TUNKCR03	200	Optimal	All four of the velocity/depth regimes present. Water reaches base of both lower banks. 90% of streambank surfaces covered by vegetation.
JONASCR01	191	Optimal	Greater than 50% mix of boulder, cobble, undercut banks, or other stable habitat. Well developed riffle and run. Streambank stable, 90% vegetated surfaces. Width of riparian zone <6 meters.

Site Number	Score	Category	Influences
POHOCR08	149	Suboptimal	Width of riparian zone <6 meters. Occurrence of riffles infrequent. 70 - 90% of the streambank surfaces covered by vegetation, moderately stable.
WEIRCR02	170	Suboptimal	Only 3 of the 4 velocity/depth regimes present. Gravel, cobble, and boulders particles are 50-75% surrounded by fine sediment. 90% of the streambank surfaces covered by vegetation; width of riparian zone <6 meters.
POHOCR06	196	Optimal	Well developed riffle and run. All 4 velocity/depth regimes present. Banks stable, 90% of the streambank surfaces covered by vegetation.
BUCKCR01	162	Suboptimal	Disruption of streambank vegetation is evident, patches of bare soil and closely chopped vegetation common. Only 3 of the 4 velocity/depth regimes present. Width of riparian zone <6 meters.
AQUACR09	209	Optimal	Greater than 50% mix of boulder, cobble, undercut banks, or other stable habitat. Water reaches base of both lower banks. More than 90% of the streambank surfaces covered by vegetation; width of riparian zone 12 -18 meters.
AQUACR10	182	Suboptimal-Optimal	All 4 velocity/depth regimes present. Water reaches base of both lower banks. Occurrence of riffles relatively frequent. Width of riparian zone <6 meters.
MARSCR08	175	Suboptimal	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediments. Occurrence of riffles infrequent. Width of riparian zone 6 - 12 meters.
MARSCR09	171	Suboptimal	Water reaches base of both lower banks. Occurrence of riffles infrequent. Width of riparian zone <6 meters.
SAMBCR10	156	Suboptimal	Only 3 of the 4 velocity/depth regimes present. Width of riparian zone <6 meters. Water fills 25 – 75% of available channel.

Site Number	Score	Category	Influences
BRODCR14	169	Suboptimal	All 4 velocity/depth regimes present. Water fills 25 – 75% of available channel. Well developed riffle and run. Width of riparian zone 6 -12 meters.
BRODCR15	141	Suboptimal-	Gravel, cobble, and boulder particles are 0 -25% surrounded by fine sediments. Occurrence of riffles relatively frequent. Unstable banks, many raw areas
CRANCR01	170	Suboptimal-	Only 3 of the 4 velocity/depth regimes present. Occurrence of riffles relatively frequent. Gravel, cobble, and boulder particles are 0 -25% surrounded by fine sediments.
MCMICR28	185	Suboptimal-Optimal	Greater than 50% mix of boulder, cobble, undercut banks, or other stable habitat. All 4 velocity/depth regimes present. Width of riparian zone <6 meters.
BRODCR01	181	Suboptimal-Optimal	Evidence of past channelization present. Excellent mix of boulder, cobble, submerged logs, undercut banks or other stable habitat. Width of riparian zone 6 - 12 meters.
BRODCR12	183	Suboptimal-Optimal	Excellent mix of boulder, cobble, undercut banks, or other stable habitat. Width of riparian zone 6 - 12 meters.
BUSHCR07	193	Optimal	Well developed riffle and run. Water fills > 75% of the available channel. All 4 velocity/depth regimes present.
BRODCR13	151	Suboptimal	30 - 50% mix of boulder, cobble, or other stable habitat. Water fills > 75% of the available channel. Width of riparian zone >18 meters.
CHERCR11	175	Suboptimal	Gravel, cobble, and boulder particles are 0 -25% surrounded by fine sediments. Well developed riffle and run. All 4 velocity/depth regimes present
MCMICR30	157	Suboptimal	Streambank moderately stable, 70 - 90% of the surfaces covered by vegetation, Water fills > 75% of the available channel.

Site Number	Score	Category	Influences
TUNKCR06	211	Optimal	Glide/Pool prevalence Streambank stable. More then 90% of the surfaces covered by vegetation. Width of riparian zone >18 meters.

Appendix D:
Pebble Count

PEBBLE COUNT

The pebble count is a measure of stream substrate composition. Substrate (the base on which an organism lives, in this case the stream bottom) is one of the most important factors which controls the community of macroinvertebrates. Large gravel to large cobble are the ideal substrates for macroinvertebrates, giving them places to live and reproduce. The worst substrate is that dominated by silt and sand because these substrates do not provide pockets between particles for the insects to live. Over a period of time, the natural substrate may be greatly altered by the discharge of organic matter. The location and expanse of various substrate types may also change due to normal variations in hydraulic factors such as volume of flow.

Substrate types

Silt/Clay – any particle less than .062 mm across

Sand – any particle .062 mm to 2.0 mm across

Gravel – any particle 2.0 mm to 64 mm across

Cobble – any particle 64 mm to 256 mm across

Boulder – any particle 256 mm to 2048 mm across

Bedrock – any particle greater than 2048 mm across

Sediment is one of the most significant pollutants that is generated by development activities and is subsequently transported by stormwater runoff. Sediments are mainly composed of materials such as soil which may be eroded from uplands and are capable of transporting toxins and trace metals that may lead to increased turbidity and reduced light penetration. These particulates are capable of altering the composition of the benthic macroinvertebrate communities by accumulating on the stream bed between cobbles and stones thus reducing habitat quality and the overall aesthetic and biological importance of the water body.

The following information is provided to facilitate an understanding of the pebble counts between different years. The reported numerical portion corresponds to the D-50, which represents the average particle size within the streambed. If the data results in a change which decreases the average particle size, that corresponds to an increase in deposition. If the change results in an increased particle size, that would correspond to movement of the stream bottom. The MCPC is currently working to refine the information collected and implementing new strategies by marking sites for consistent data collection. Please note that the county has undergone three years of flooding events which contribute to scouring and gravel bar creation thus influencing the pebble count results. The final determination is ambiguous as to why these sites have experienced this high level of fluctuation. Future work must be preformed with individual site analysis to interpreted theses results.

Site #	2005	2006	Change	Result
AQUACR09	73.5	42.6	*-30.9*	Deposition
AQUACR10	80.8	50.2	*-30.6*	Deposition
BRODCR01	68.2	57.3	*-10.6*	Deposition
BRODCR12	66.5	85.5	*19*	Movement
BRODCR13	98.7	29.8	*-68.9*	Deposition
BRODCR14	*	81	*	*
BRODCR15	*	43.9	*	*
BUCKCR01	74.7	26.5	*-48.2*	Deposition
BUSHCR07	138.9	78.2	*-60.7*	Deposition
BUTZRU01	33.7	38.5	*4.8*	Movement
CHERCR11	*	62.8	*	*
CRANCR01	*	99.5	*	*
CRCRPA01	56	56.1	*0.1*	
CRCRPA03	*	109.7	*	*
DEHOCR04	45	78.9	*33.9*	Movement
DRSARU01	90	141.1	*51.1*	Movement
FOHIRU01	64	49.9	*-14.1*	Deposition
FOHIRU06	*	39.8	*	*
FOHIRU09	144.9	83.1	*-61.8*	Deposition
HAWKRU02	74.6	22	*-52.6*	Deposition
INDIRU01	61.7	66.5	*4.8*	Movement
JONASCR01	*	65.8	*	*
LEHIRI01	*	128	*	*
LEHIRI02	*	83.8	*	*
MARSCR08	73.8	57.7	*-16.1*	Deposition
MARSCR09	95.7	51	*-44.7*	Deposition
MCMICR21	40.2	85	*44.8*	Movement
MCMICR28	37.9	65.1	*27.2*	Movement
MCMICR30	92.3	62.3	*-30*	Deposition

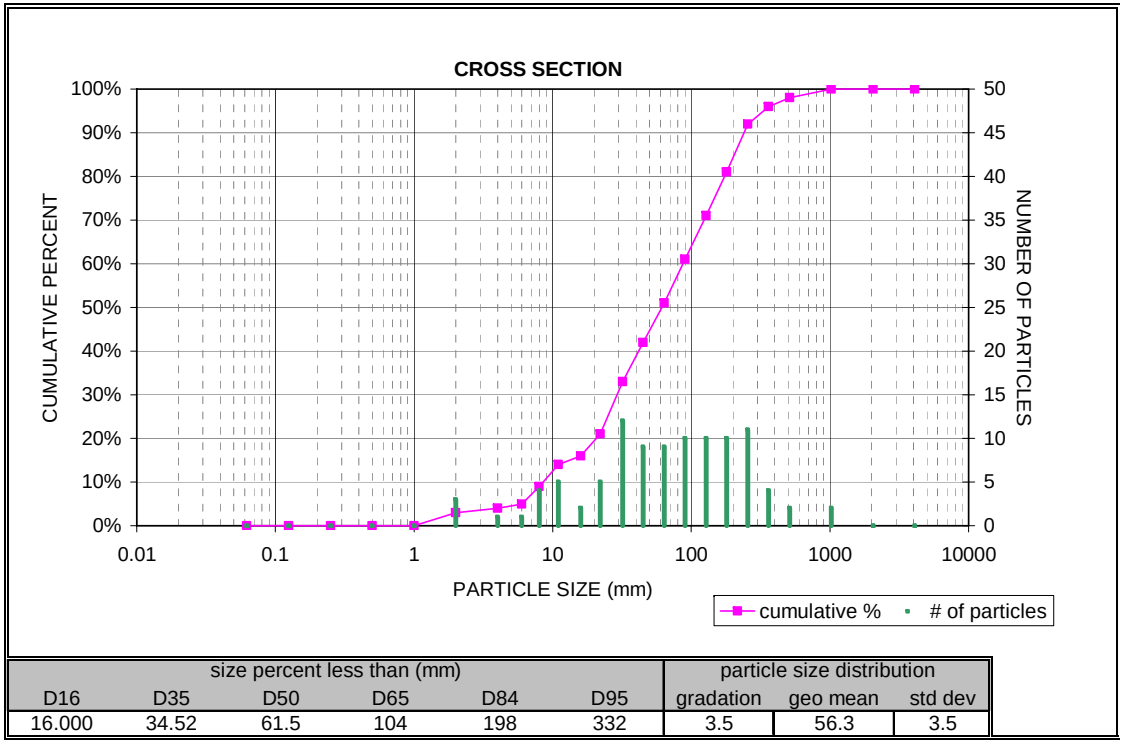
Site #	2005	2006	Change	Result
PARACR01	141.1	174	*32.9*	Movement
PARACR03	43.7	61.5	*17.8*	Movement
PARACR04	42	51.8	*9.8*	Movement
POCOCR14	42	68.8	*-26.8*	Deposition
POCOCR15	129.8	111.9	*-17.9*	Deposition
POCOCR16	41	56.9	*15.9*	Movement
POCOCR17	58.3	81.3	*23*	Movement
POCOCR18	42.5	53.7	*11.2*	Movement
POCOCR19	76.7	122.1	*45.4*	Movement
POCOCR20	66.2	100.5	*34.3*	Movement
POCOCR22	73.4	131.4	*58*	Movement
POHOCR06	53.7	42.4	*-11.3*	Deposition
POHOCR08	*	70.8	*	*
REDRU03	0.3	0.2	*-0.1*	*
SAMBCR10	106.4	97.3	*-9.1*	Deposition
SCOTCR04	52.8	47.3	*-5.5*	Deposition
SWIFCR02	95.1	78.1	*-17*	Deposition
SWIFCR03	105.6	54.1	*-51.5*	Deposition
SWIFCR05	68.7	36.9	*-31.8*	Deposition
SWIFCR06	105.6	77.8	*-27.8*	Deposition
SWIFCR07	75.3	69	*-6.3*	Deposition
TOBYCR01	92.2	96.6	*-4.4*	Deposition
TOBYCR14	81.1	81.4	*-0.3*	Deposition
TROUCR03	*	81	*	*
TUNKCR03	74.8	96.9	*22.1*	Movement
TUNKCR06	*	*	*	*
WEIRCR02	*	16	*	*

*No Data The following pages contain the pebble count data for the 2006 sampling sites.

Pebble Count (Cross Section)

SITE ID: PARACR03

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	3	3%
very fine gravel	2	4	1	4%
fine gravel	4	6	1	5%
fine gravel	6	8	4	9%
medium gravel	8	11	5	14%
medium gravel	11	16	2	16%
coarse gravel	16	22	5	21%
coarse gravel	22	32	12	33%
very coarse gravel	32	45	9	42%
very coarse gravel	45	64	9	51%
small cobble	64	90	10	61%
medium cobble	90	128	10	71%
large cobble	128	180	10	81%
very large cobble	180	256	11	92%
small boulder	256	362	4	96%
small boulder	362	512	2	98%
medium boulder	512	1024	2	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

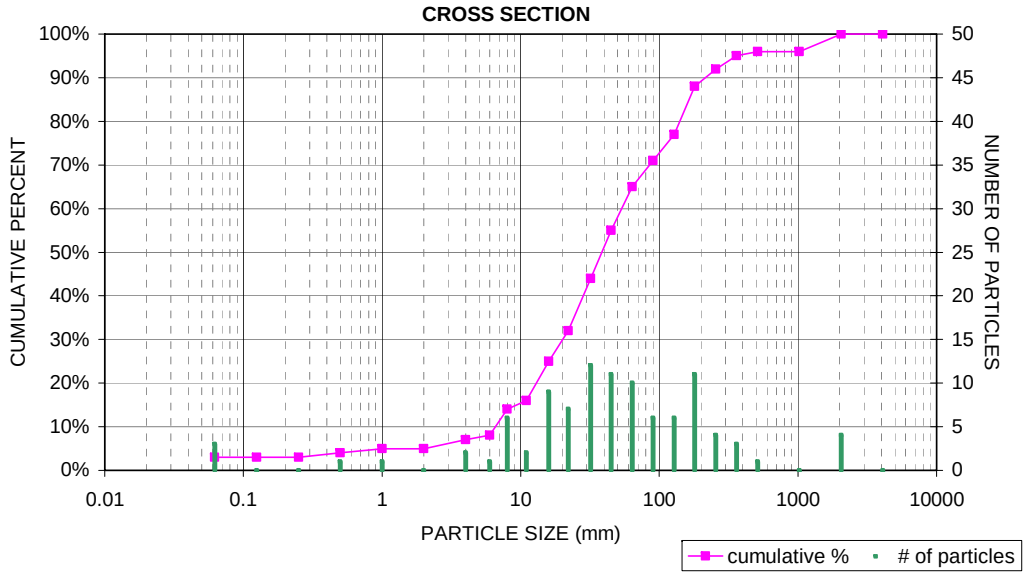


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
16.000	34.52	61.5	104	198	332	3.5	56.3	3.5

Pebble Count (Cross Section)

SITE ID: BUTZRU01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	3	3%
very fine sand	0.062	0.13	0	3%
fine sand	0.13	0.25	0	3%
medium sand	0.25	0.5	1	4%
coarse sand	0.5	1	1	5%
very coarse sand	1	2	0	5%
very fine gravel	2	4	2	7%
fine gravel	4	6	1	8%
fine gravel	6	8	6	14%
medium gravel	8	11	2	16%
medium gravel	11	16	9	25%
coarse gravel	16	22	7	32%
coarse gravel	22	32	12	44%
very coarse gravel	32	45	11	55%
very coarse gravel	45	64	10	65%
small cobble	64	90	6	71%
medium cobble	90	128	6	77%
large cobble	128	180	11	88%
very large cobble	180	256	4	92%
small boulder	256	362	3	95%
small boulder	362	512	1	96%
medium boulder	512	1024	0	96%
large - very large boulder	1024	2048	4	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

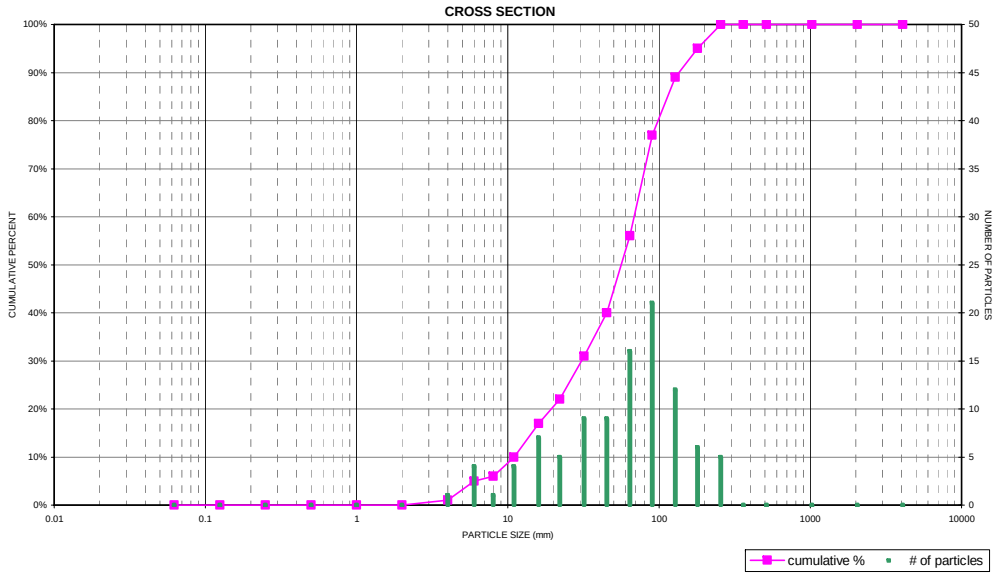


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
11.000	24.16	38.5	64	159	362	3.8	41.8	3.8

Pebble Count (Cross Section)

SITE ID: CRCRPA01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	1	1%
fine gravel	4	6	4	5%
fine gravel	6	8	1	6%
medium gravel	8	11	4	10%
medium gravel	11	16	7	17%
coarse gravel	16	22	5	22%
coarse gravel	22	32	9	31%
very coarse gravel	32	45	9	40%
very coarse gravel	45	64	16	56%
small cobble	64	90	21	77%
medium cobble	90	128	12	89%
large cobble	128	180	6	95%
very large cobble	180	256	5	100%
small boulder	256	362	0	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

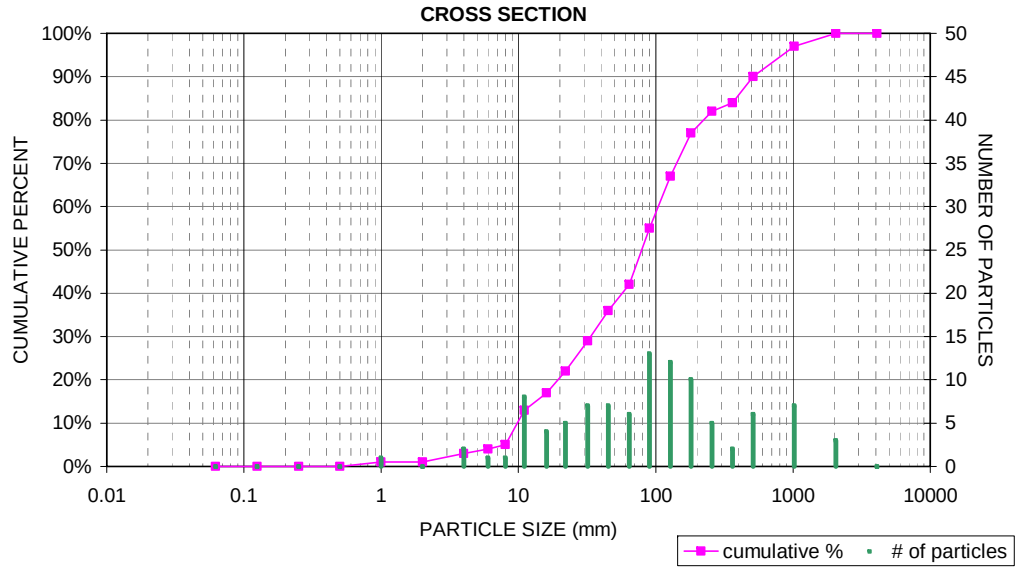


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
15.166	37.24	56.1	74	111	180	2.8	40.9	2.7

Pebble Count (Cross Section)

SITE ID: DEHOCR04

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	1	1%
very coarse sand	1	2	0	1%
very fine gravel	2	4	2	3%
fine gravel	4	6	1	4%
fine gravel	6	8	1	5%
medium gravel	8	11	8	13%
medium gravel	11	16	4	17%
coarse gravel	16	22	5	22%
coarse gravel	22	32	7	29%
very coarse gravel	32	45	7	36%
very coarse gravel	45	64	6	42%
small cobble	64	90	13	55%
medium cobble	90	128	12	67%
large cobble	128	180	10	77%
very large cobble	180	256	5	82%
small boulder	256	362	2	84%
small boulder	362	512	6	90%
medium boulder	512	1024	7	97%
large - very large boulder	1024	2048	3	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

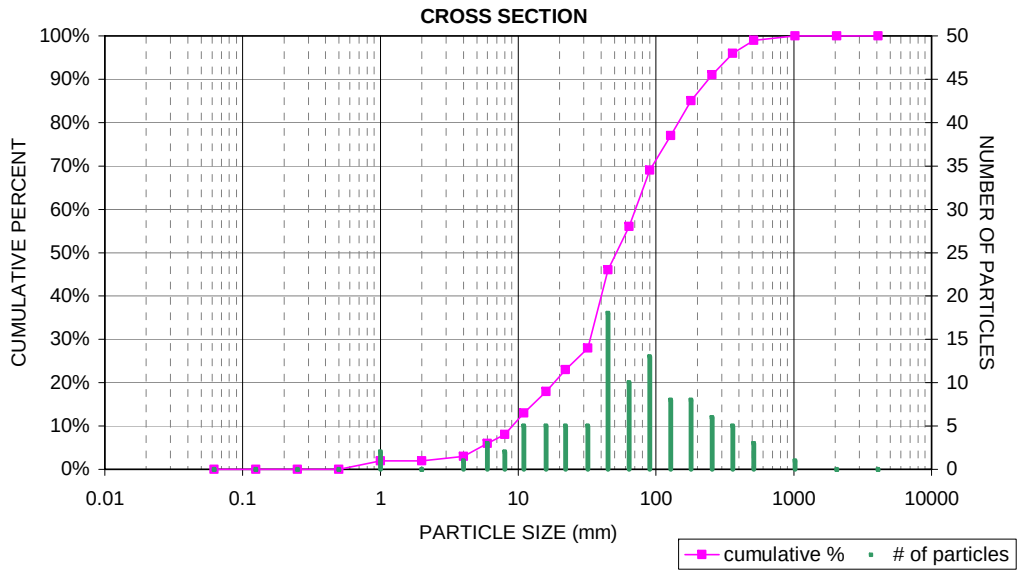


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
14.569	42.86	78.9	121	362	840	5.0	72.6	5.0

Pebble Count (Cross Section)

SITE ID: PARACR04

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	2	2%
very coarse sand	1	2	0	2%
very fine gravel	2	4	1	3%
fine gravel	4	6	3	6%
fine gravel	6	8	2	8%
medium gravel	8	11	5	13%
medium gravel	11	16	5	18%
coarse gravel	16	22	5	23%
coarse gravel	22	32	5	28%
very coarse gravel	32	45	18	46%
very coarse gravel	45	64	10	56%
small cobble	64	90	13	69%
medium cobble	90	128	8	77%
large cobble	128	180	8	85%
very large cobble	180	256	6	91%
small boulder	256	362	5	96%
small boulder	362	512	3	99%
medium boulder	512	1024	1	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

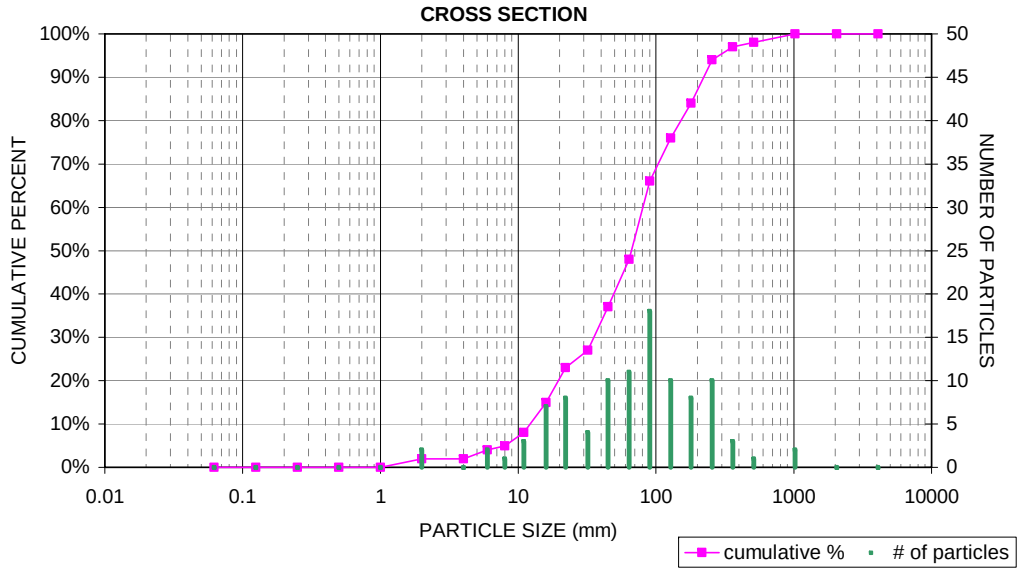


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
13.773	36.54	51.8	81	172	338	3.5	48.7	3.5

Pebble Count (Cross Section)

SITE ID: INDIRU01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	2	2%
very fine gravel	2	4	0	2%
fine gravel	4	6	2	4%
fine gravel	6	8	1	5%
medium gravel	8	11	3	8%
medium gravel	11	16	7	15%
coarse gravel	16	22	8	23%
coarse gravel	22	32	4	27%
very coarse gravel	32	45	10	37%
very coarse gravel	45	64	11	48%
small cobble	64	90	18	66%
medium cobble	90	128	10	76%
large cobble	128	180	8	84%
very large cobble	180	256	10	94%
small boulder	256	362	3	97%
small boulder	362	512	1	98%
medium boulder	512	1024	2	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

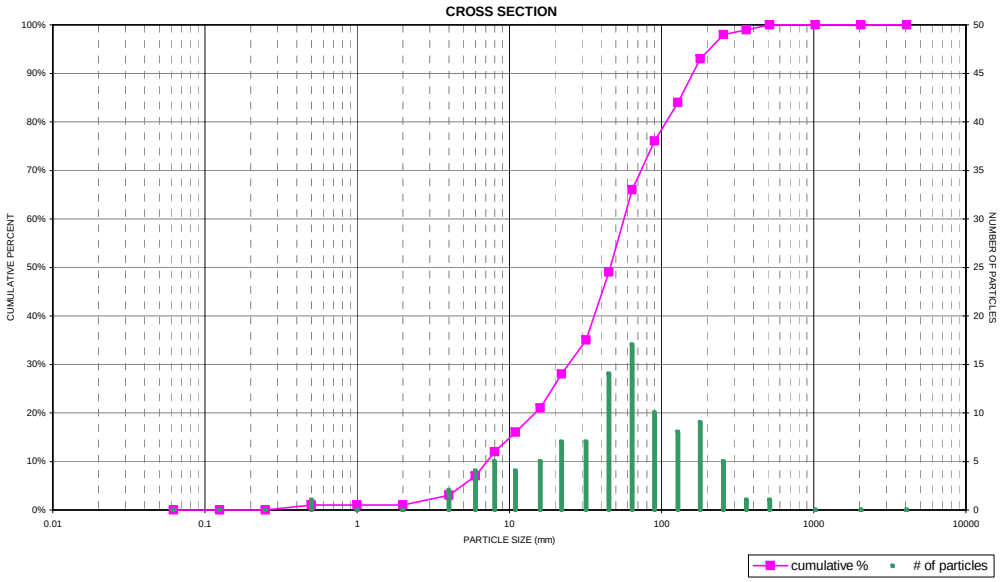


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
16.650	42.03	66.5	88	180	287	3.4	54.7	3.3

Pebble Count (Cross Section)

SITE ID: FOHIRU01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	1	1%
coarse sand	0.5	1	0	1%
very coarse sand	1	2	0	1%
very fine gravel	2	4	2	3%
fine gravel	4	6	4	7%
fine gravel	6	8	5	12%
medium gravel	8	11	4	16%
medium gravel	11	16	5	21%
coarse gravel	16	22	7	28%
coarse gravel	22	32	7	35%
very coarse gravel	32	45	14	49%
very coarse gravel	45	64	17	66%
small cobble	64	90	10	76%
medium cobble	90	128	8	84%
large cobble	128	180	9	93%
very large cobble	180	256	5	98%
small boulder	256	362	1	99%
small boulder	362	512	1	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

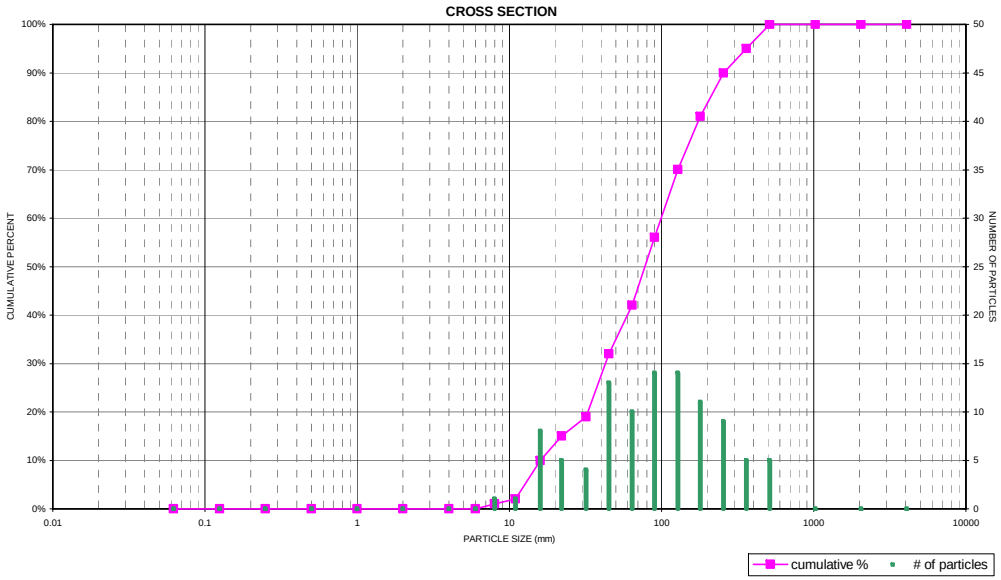


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
11.000	32.00	45.9	63	128	207	3.5	37.5	3.4

Pebble Count (Cross Section)

SITE ID: SWIFCR06

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	0	0%
fine gravel	6	8	1	1%
medium gravel	8	11	1	2%
medium gravel	11	16	8	10%
coarse gravel	16	22	5	15%
coarse gravel	22	32	4	19%
very coarse gravel	32	45	13	32%
very coarse gravel	45	64	10	42%
small cobble	64	90	14	56%
medium cobble	90	128	14	70%
large cobble	128	180	11	81%
very large cobble	180	256	9	90%
small boulder	256	362	5	95%
small boulder	362	512	5	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

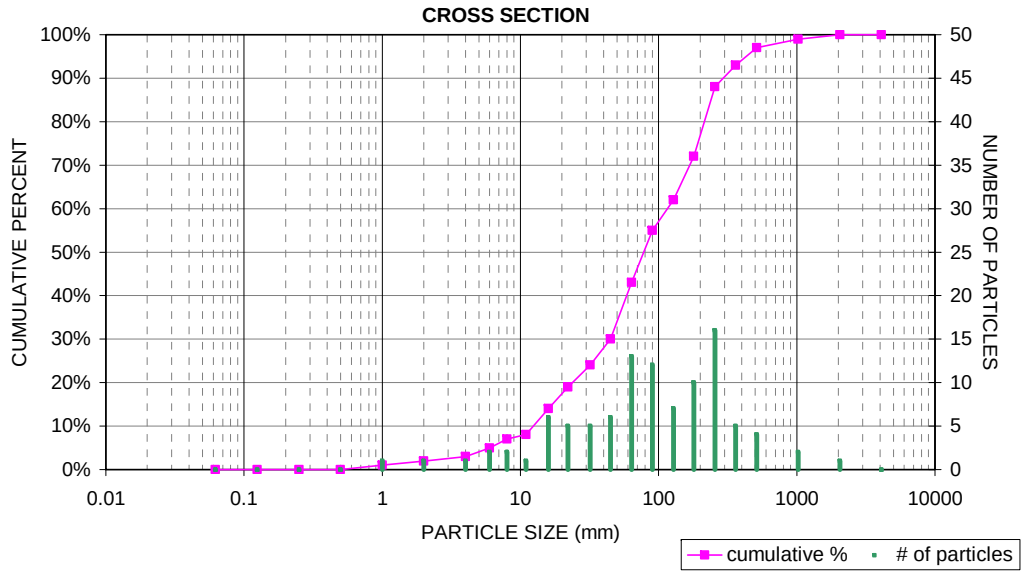


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
24.160	50.02	77.8	113	202	362	2.9	69.9	2.9

Pebble Count (Cross Section)

SITE ID: SWIFCR02

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	1	1%
very coarse sand	1	2	1	2%
very fine gravel	2	4	1	3%
fine gravel	4	6	2	5%
fine gravel	6	8	2	7%
medium gravel	8	11	1	8%
medium gravel	11	16	6	14%
coarse gravel	16	22	5	19%
coarse gravel	22	32	5	24%
very coarse gravel	32	45	6	30%
very coarse gravel	45	64	13	43%
small cobble	64	90	12	55%
medium cobble	90	128	7	62%
large cobble	128	180	10	72%
very large cobble	180	256	16	88%
small boulder	256	362	5	93%
small boulder	362	512	4	97%
medium boulder	512	1024	2	99%
large - very large boulder	1024	2048	1	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

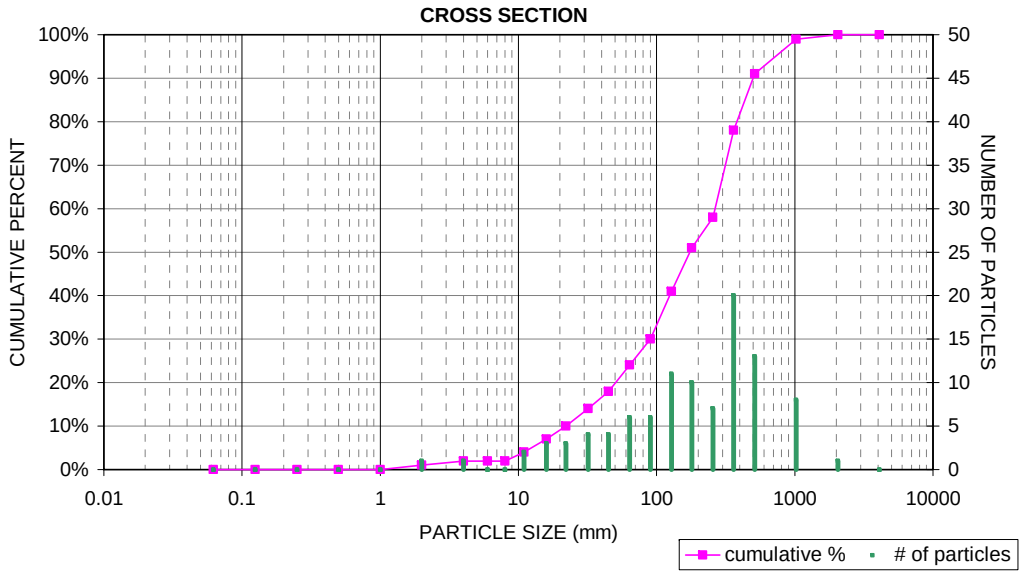


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
18.174	51.53	78.1	142	234	431	3.6	65.3	3.6

Pebble Count (Cross Section)

SITE ID:PARACR01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	1	1%
very fine gravel	2	4	1	2%
fine gravel	4	6	0	2%
fine gravel	6	8	0	2%
medium gravel	8	11	2	4%
medium gravel	11	16	3	7%
coarse gravel	16	22	3	10%
coarse gravel	22	32	4	14%
very coarse gravel	32	45	4	18%
very coarse gravel	45	64	6	24%
small cobble	64	90	6	30%
medium cobble	90	128	11	41%
large cobble	128	180	10	51%
very large cobble	180	256	7	58%
small boulder	256	362	20	78%
small boulder	362	512	13	91%
medium boulder	512	1024	8	99%
large - very large boulder	1024	2048	1	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

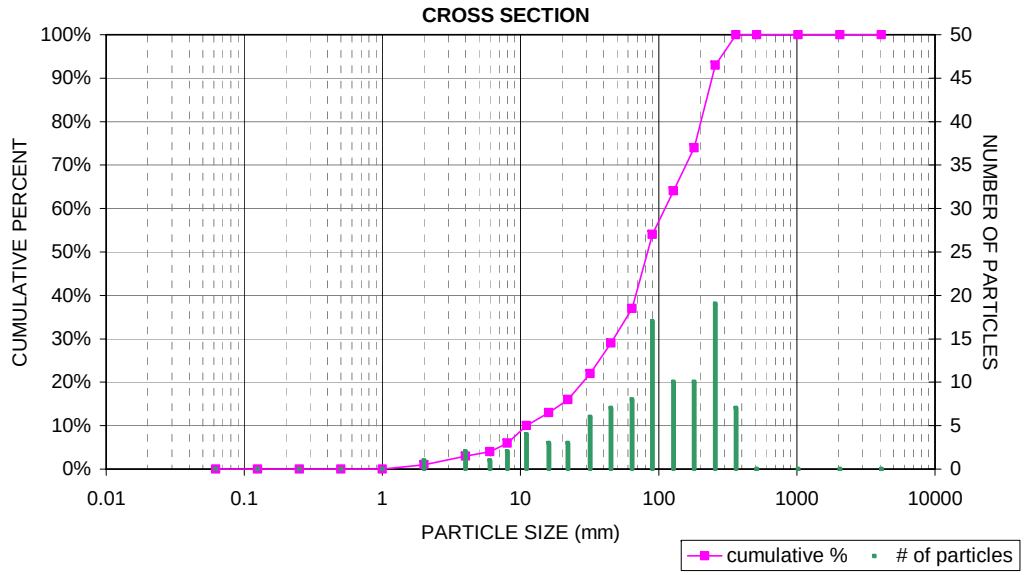


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
37.947	105.63	174.0	289	425	724	3.5	127.0	3.3

Pebble Count (Cross Section)

SITE ID:FOHIRU09

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	1	1%
very fine gravel	2	4	2	3%
fine gravel	4	6	1	4%
fine gravel	6	8	2	6%
medium gravel	8	11	4	10%
medium gravel	11	16	3	13%
coarse gravel	16	22	3	16%
coarse gravel	22	32	6	22%
very coarse gravel	32	45	7	29%
very coarse gravel	45	64	8	37%
small cobble	64	90	17	54%
medium cobble	90	128	10	64%
large cobble	128	180	10	74%
very large cobble	180	256	19	93%
small boulder	256	362	7	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

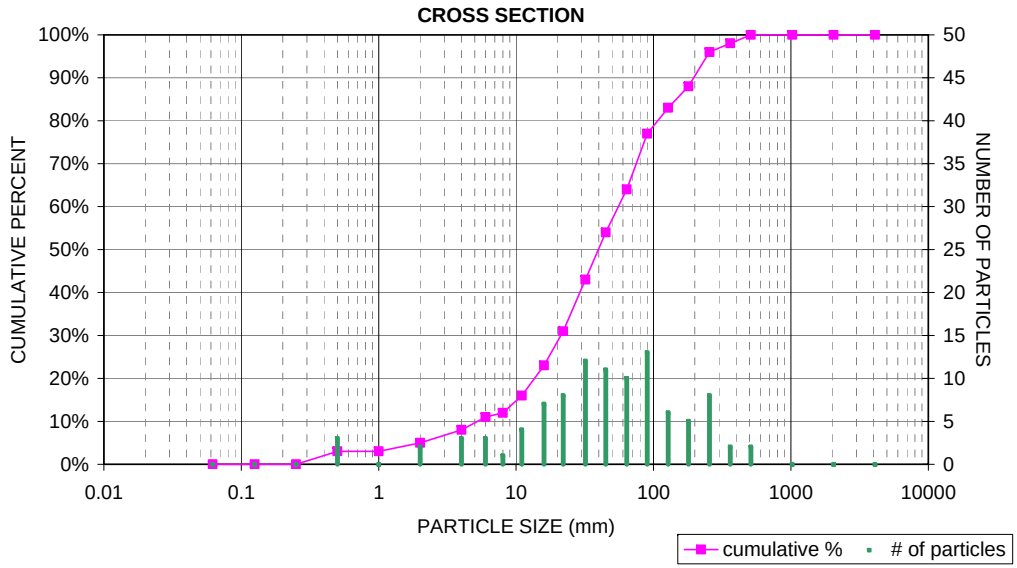


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
22.000	58.61	83.1	132	217	283	3.2	69.0	3.1

Pebble Count (Cross Section)

SITE ID:FOHIRU06

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	3	3%
coarse sand	0.5	1	0	3%
very coarse sand	1	2	2	5%
very fine gravel	2	4	3	8%
fine gravel	4	6	3	11%
fine gravel	6	8	1	12%
medium gravel	8	11	4	16%
medium gravel	11	16	7	23%
coarse gravel	16	22	8	31%
coarse gravel	22	32	12	43%
very coarse gravel	32	45	11	54%
very coarse gravel	45	64	10	64%
small cobble	64	90	13	77%
medium cobble	90	128	6	83%
large cobble	128	180	5	88%
very large cobble	180	256	8	96%
small boulder	256	362	2	98%
small boulder	362	512	2	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

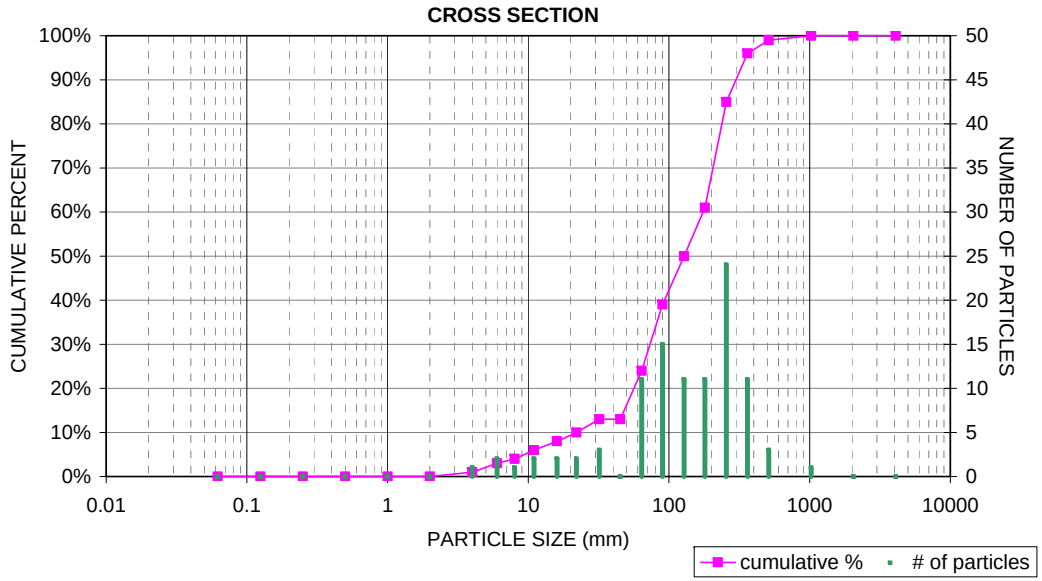


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
11.000	24.93	39.8	66	137	245	3.5	38.8	3.5

Pebble Count (Cross Section)

SITE ID:LEHIRI01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	1	1%
fine gravel	4	6	2	3%
fine gravel	6	8	1	4%
medium gravel	8	11	2	6%
medium gravel	11	16	2	8%
coarse gravel	16	22	2	10%
coarse gravel	22	32	3	13%
very coarse gravel	32	45	0	13%
very coarse gravel	45	64	11	24%
small cobble	64	90	15	39%
medium cobble	90	128	11	50%
large cobble	128	180	11	61%
very large cobble	180	256	24	85%
small boulder	256	362	11	96%
small boulder	362	512	3	99%
medium boulder	512	1024	1	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

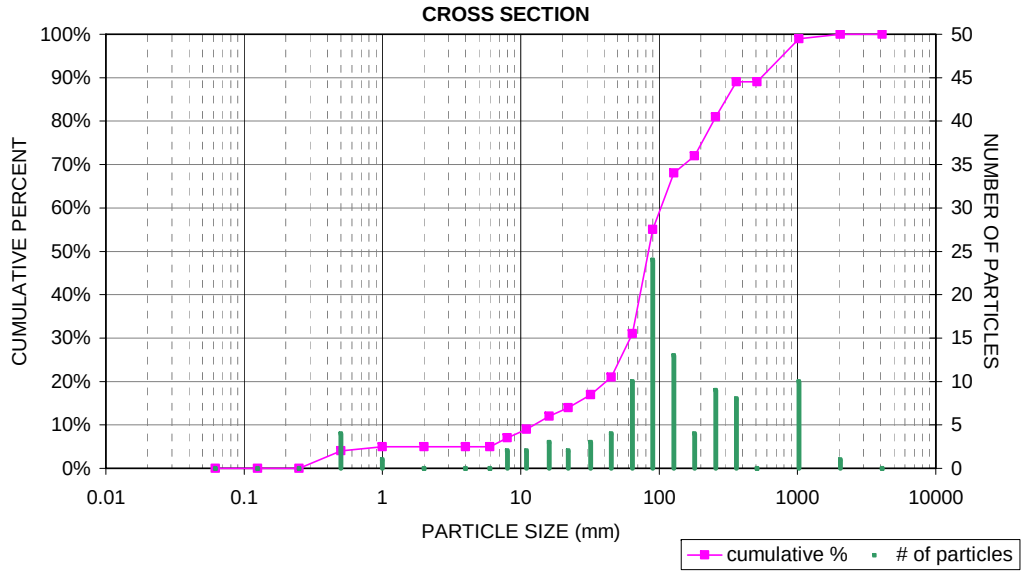


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
49.537	82.18	128.0	191	252	351	2.3	111.8	2.3

Pebble Count (Cross Section)

SITE ID:LEHIRI02

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	4	4%
coarse sand	0.5	1	1	5%
very coarse sand	1	2	0	5%
very fine gravel	2	4	0	5%
fine gravel	4	6	0	5%
fine gravel	6	8	2	7%
medium gravel	8	11	2	9%
medium gravel	11	16	3	12%
coarse gravel	16	22	2	14%
coarse gravel	22	32	3	17%
very coarse gravel	32	45	4	21%
very coarse gravel	45	64	10	31%
small cobble	64	90	24	55%
medium cobble	90	128	13	68%
large cobble	128	180	4	72%
very large cobble	180	256	9	81%
small boulder	256	362	8	89%
small boulder	362	512	0	89%
medium boulder	512	1024	10	99%
large - very large boulder	1024	2048	1	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

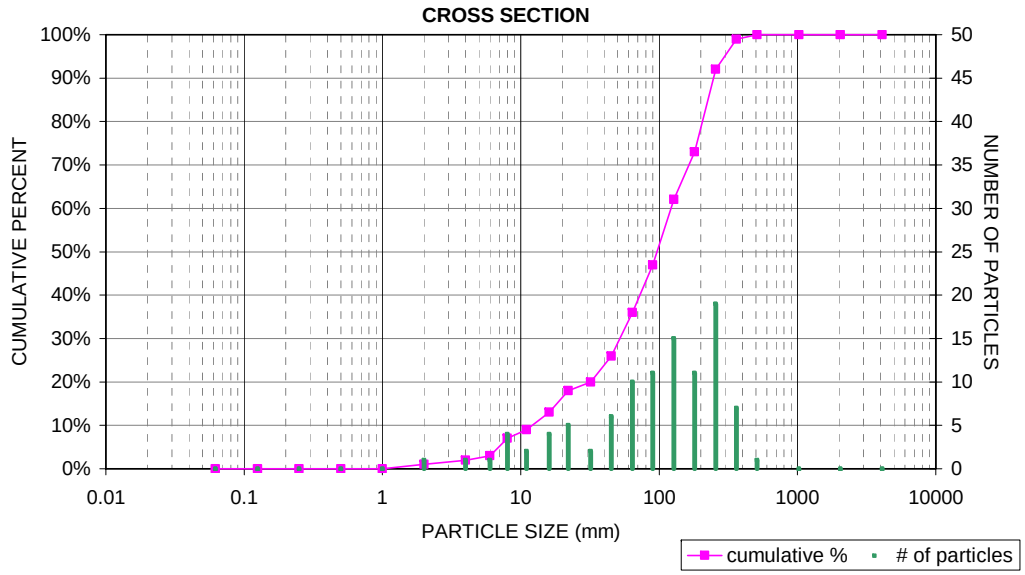


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
28.243	67.74	83.8	118	292	776	3.2	90.7	3.2

Pebble Count (Cross Section)

SITE ID:TOBYCR01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	1	1%
very fine gravel	2	4	1	2%
fine gravel	4	6	1	3%
fine gravel	6	8	4	7%
medium gravel	8	11	2	9%
medium gravel	11	16	4	13%
coarse gravel	16	22	5	18%
coarse gravel	22	32	2	20%
very coarse gravel	32	45	6	26%
very coarse gravel	45	64	10	36%
small cobble	64	90	11	47%
medium cobble	90	128	15	62%
large cobble	128	180	11	73%
very large cobble	180	256	19	92%
small boulder	256	362	7	99%
small boulder	362	512	1	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

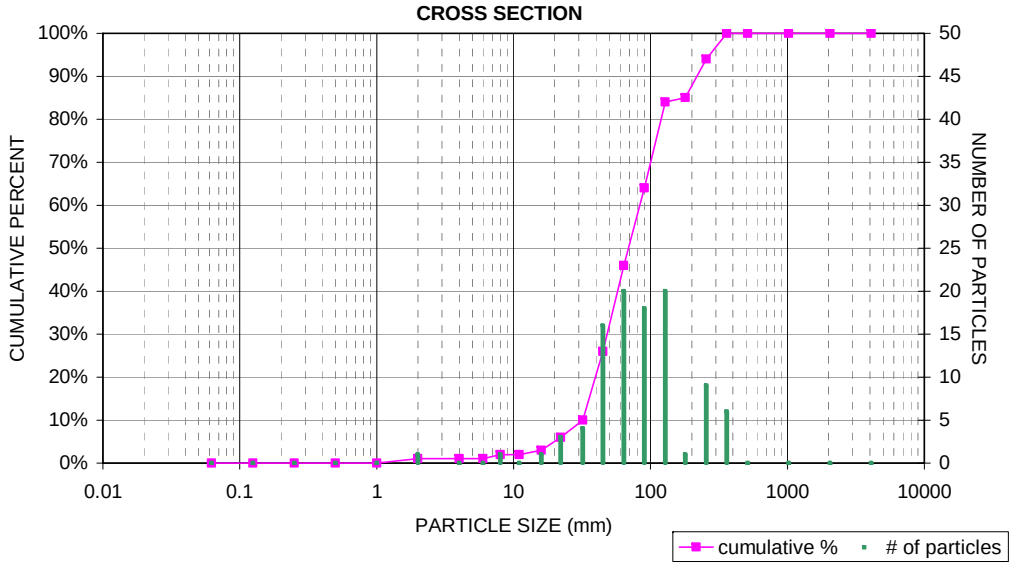


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
19.369	61.79	96.6	140	221	297	3.6	65.4	3.4

Pebble Count (Cross Section)

SITE ID: SWIFCR07

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	1	1%
very fine gravel	2	4	0	1%
fine gravel	4	6	0	1%
fine gravel	6	8	1	2%
medium gravel	8	11	0	2%
medium gravel	11	16	1	3%
coarse gravel	16	22	3	6%
coarse gravel	22	32	4	10%
very coarse gravel	32	45	16	26%
very coarse gravel	45	64	20	46%
small cobble	64	90	18	64%
medium cobble	90	128	20	84%
large cobble	128	180	1	85%
very large cobble	180	256	9	94%
small boulder	256	362	6	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

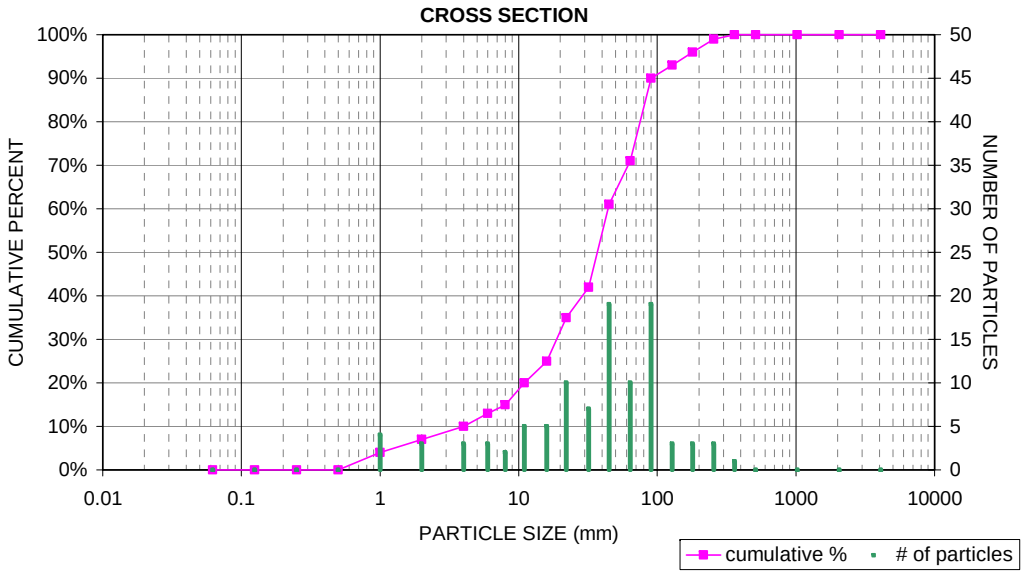


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
36.364	52.73	69.0	92	128	271	1.9	68.2	1.9

Pebble Count (Cross Section)

SITE ID: SWIFCR05

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	4	4%
very coarse sand	1	2	3	7%
very fine gravel	2	4	3	10%
fine gravel	4	6	3	13%
fine gravel	6	8	2	15%
medium gravel	8	11	5	20%
medium gravel	11	16	5	25%
coarse gravel	16	22	10	35%
coarse gravel	22	32	7	42%
very coarse gravel	32	45	19	61%
very coarse gravel	45	64	10	71%
small cobble	64	90	19	90%
medium cobble	90	128	3	93%
large cobble	128	180	3	96%
very large cobble	180	256	3	99%
small boulder	256	362	1	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

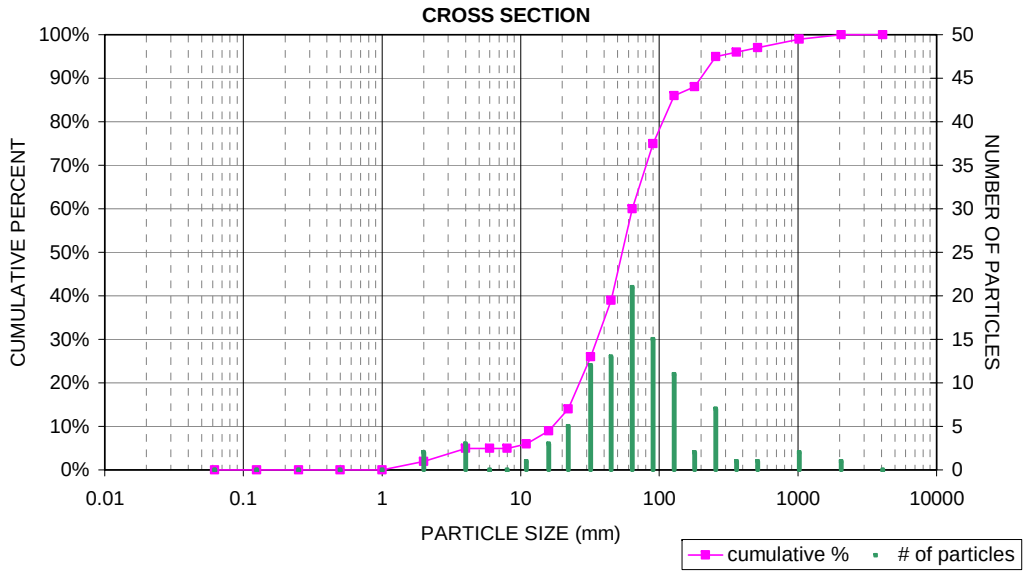


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
8.526	22.00	36.9	52	81	161	3.3	26.2	3.1

Pebble Count (Cross Section)

SITE ID:SWIFCR03

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	2	2%
very fine gravel	2	4	3	5%
fine gravel	4	6	0	5%
fine gravel	6	8	0	5%
medium gravel	8	11	1	6%
medium gravel	11	16	3	9%
coarse gravel	16	22	5	14%
coarse gravel	22	32	12	26%
very coarse gravel	32	45	13	39%
very coarse gravel	45	64	21	60%
small cobble	64	90	15	75%
medium cobble	90	128	11	86%
large cobble	128	180	2	88%
very large cobble	180	256	7	95%
small boulder	256	362	1	96%
small boulder	362	512	1	97%
medium boulder	512	1024	2	99%
large - very large boulder	1024	2048	1	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

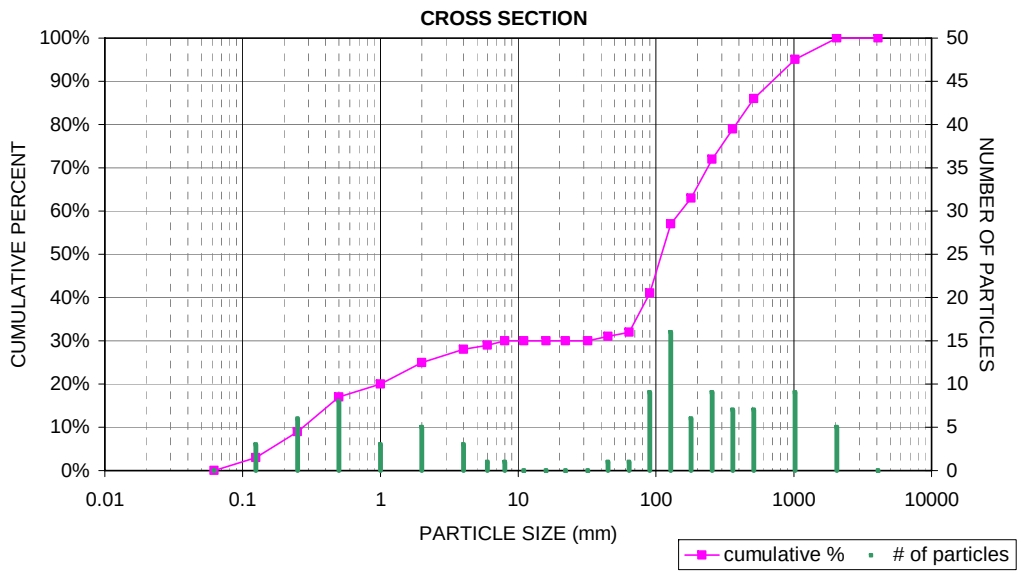


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
23.418	40.52	54.1	72	120	256	2.3	53.0	2.3

Pebble Count (Cross Section)

SITE ID: CRCRPA03

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	3	3%
fine sand	0.13	0.25	6	9%
medium sand	0.25	0.5	8	17%
coarse sand	0.5	1	3	20%
very coarse sand	1	2	5	25%
very fine gravel	2	4	3	28%
fine gravel	4	6	1	29%
fine gravel	6	8	1	30%
medium gravel	8	11	0	30%
medium gravel	11	16	0	30%
coarse gravel	16	22	0	30%
coarse gravel	22	32	0	30%
very coarse gravel	32	45	1	31%
very coarse gravel	45	64	1	32%
small cobble	64	90	9	41%
medium cobble	90	128	16	57%
large cobble	128	180	6	63%
very large cobble	180	256	9	72%
small boulder	256	362	7	79%
small boulder	362	512	7	86%
medium boulder	512	1024	9	95%
large - very large boulder	1024	2048	5	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

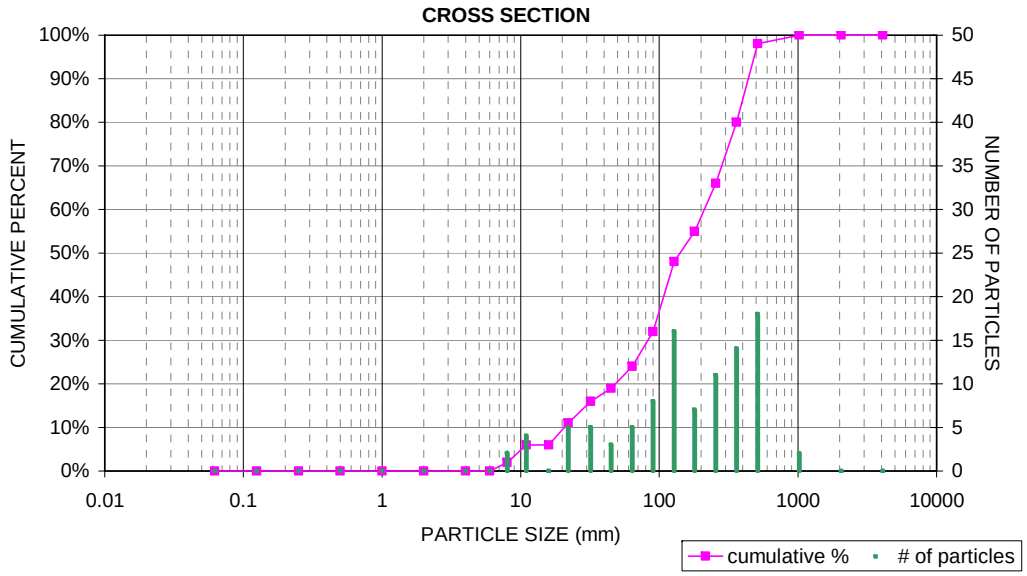


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
0.459	71.70	109.7	195	464	1024	121.8	14.6	31.8

Pebble Count (Cross Section)

SITE ID: DRSARU01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	0	0%
fine gravel	6	8	2	2%
medium gravel	8	11	4	6%
medium gravel	11	16	0	6%
coarse gravel	16	22	5	11%
coarse gravel	22	32	5	16%
very coarse gravel	32	45	3	19%
very coarse gravel	45	64	5	24%
small cobble	64	90	8	32%
medium cobble	90	128	16	48%
large cobble	128	180	7	55%
very large cobble	180	256	11	66%
small boulder	256	362	14	80%
small boulder	362	512	18	98%
medium boulder	512	1024	2	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

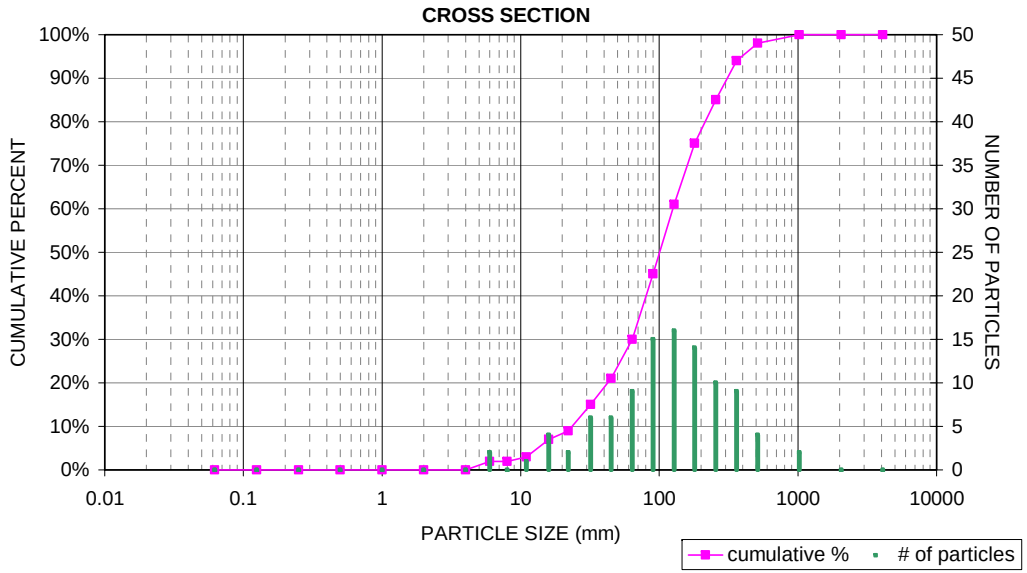


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
32.000	96.14	141.1	248	391	483	3.6	111.9	3.5

Pebble Count (Cross Section)

SITE ID: POCOCR20

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	2	2%
fine gravel	6	8	0	2%
medium gravel	8	11	1	3%
medium gravel	11	16	4	7%
coarse gravel	16	22	2	9%
coarse gravel	22	32	6	15%
very coarse gravel	32	45	6	21%
very coarse gravel	45	64	9	30%
small cobble	64	90	15	45%
medium cobble	90	128	16	61%
large cobble	128	180	14	75%
very large cobble	180	256	10	85%
small boulder	256	362	9	94%
small boulder	362	512	4	98%
medium boulder	512	1024	2	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

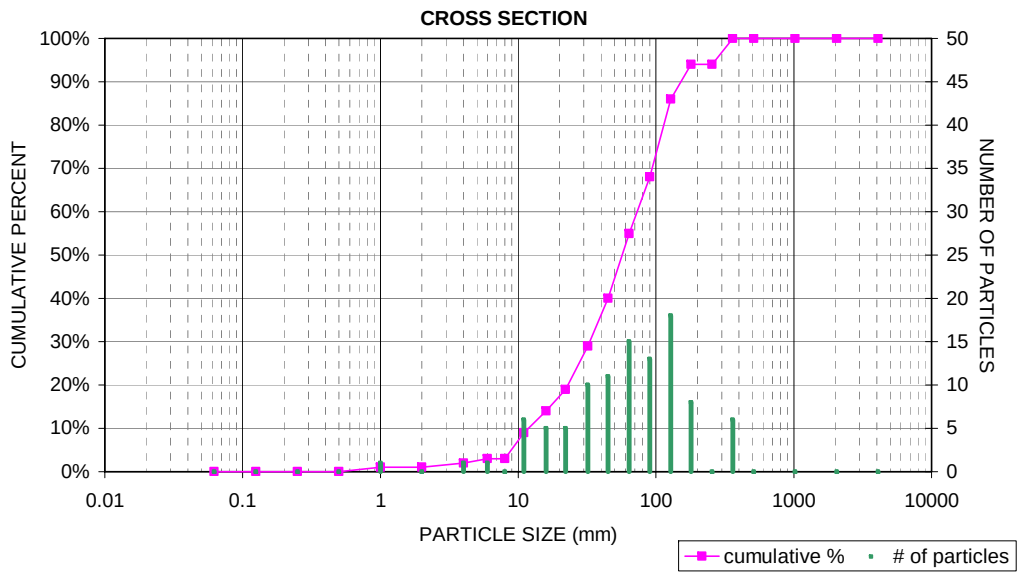


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
33.871	71.70	100.5	141	247	395	2.7	91.5	2.7

Pebble Count (Cross Section)

SITE ID:POCOCR16

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	1	1%
very coarse sand	1	2	0	1%
very fine gravel	2	4	1	2%
fine gravel	4	6	1	3%
fine gravel	6	8	0	3%
medium gravel	8	11	6	9%
medium gravel	11	16	5	14%
coarse gravel	16	22	5	19%
coarse gravel	22	32	10	29%
very coarse gravel	32	45	11	40%
very coarse gravel	45	64	15	55%
small cobble	64	90	13	68%
medium cobble	90	128	18	86%
large cobble	128	180	8	94%
very large cobble	180	256	0	94%
small boulder	256	362	6	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

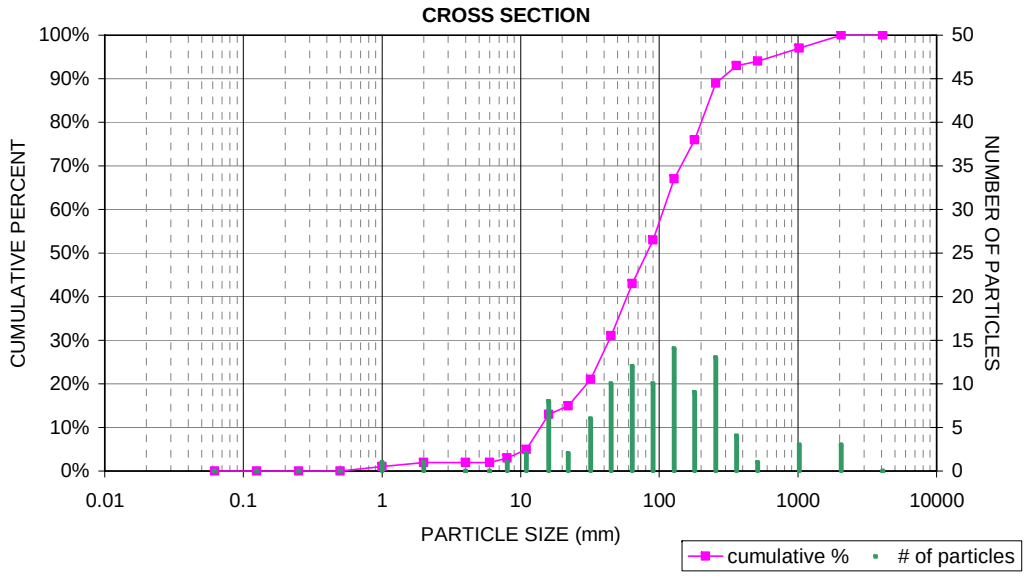


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
18.174	38.54	56.9	83	123	271	2.6	47.3	2.6

Pebble Count (Cross Section)

SITE ID: POCOCR17

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	1	1%
very coarse sand	1	2	1	2%
very fine gravel	2	4	0	2%
fine gravel	4	6	0	2%
fine gravel	6	8	1	3%
medium gravel	8	11	2	5%
medium gravel	11	16	8	13%
coarse gravel	16	22	2	15%
coarse gravel	22	32	6	21%
very coarse gravel	32	45	10	31%
very coarse gravel	45	64	12	43%
small cobble	64	90	10	53%
medium cobble	90	128	14	67%
large cobble	128	180	9	76%
very large cobble	180	256	13	89%
small boulder	256	362	4	93%
small boulder	362	512	1	94%
medium boulder	512	1024	3	97%
large - very large boulder	1024	2048	3	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

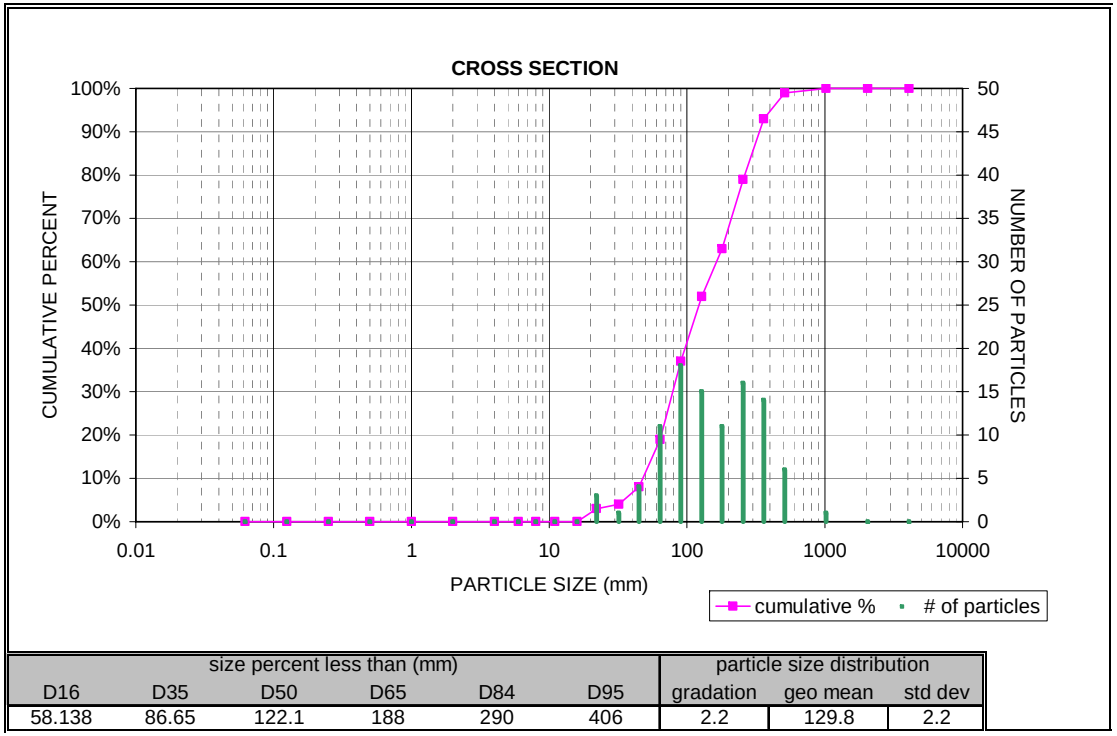


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
23.418	50.61	81.3	122	224	645	3.1	72.4	3.1

Pebble Count (Cross Section)

SITE ID: POCOCR19

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	0	0%
fine gravel	6	8	0	0%
medium gravel	8	11	0	0%
medium gravel	11	16	0	0%
coarse gravel	16	22	3	3%
coarse gravel	22	32	1	4%
very coarse gravel	32	45	4	8%
very coarse gravel	45	64	11	19%
small cobble	64	90	18	37%
medium cobble	90	128	15	52%
large cobble	128	180	11	63%
very large cobble	180	256	16	79%
small boulder	256	362	14	93%
small boulder	362	512	6	99%
medium boulder	512	1024	1	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

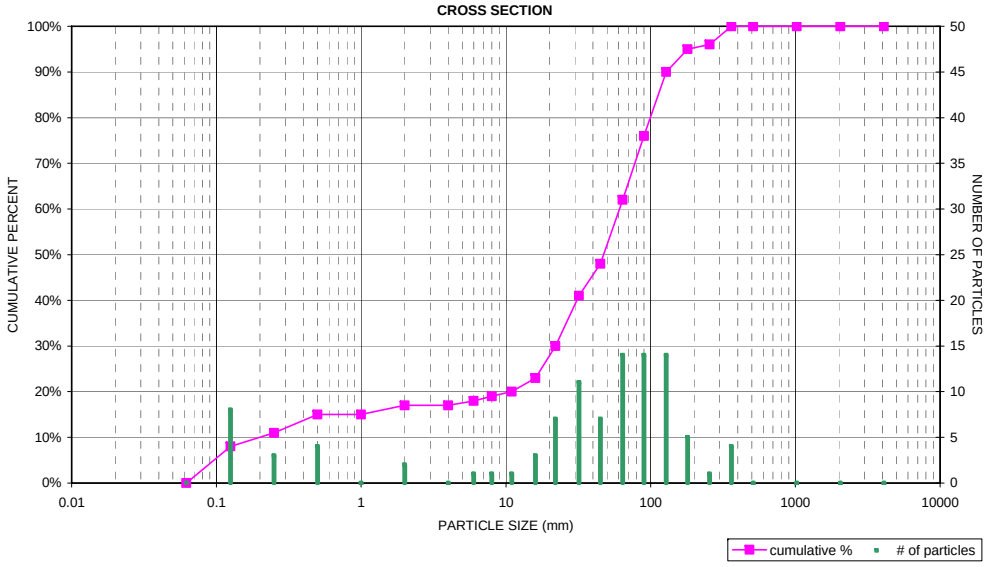


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
58.138	86.65	122.1	188	290	406	2.2	129.8	2.2

Pebble Count (Cross Section)

SITE ID: SCOTCR04

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	8	8%
fine sand	0.13	0.25	3	11%
medium sand	0.25	0.5	4	15%
coarse sand	0.5	1	0	15%
very coarse sand	1	2	2	17%
very fine gravel	2	4	0	17%
fine gravel	4	6	1	18%
fine gravel	6	8	1	19%
medium gravel	8	11	1	20%
medium gravel	11	16	3	23%
coarse gravel	16	22	7	30%
coarse gravel	22	32	11	41%
very coarse gravel	32	45	7	48%
very coarse gravel	45	64	14	62%
small cobble	64	90	14	76%
medium cobble	90	128	14	90%
large cobble	128	180	5	95%
very large cobble	180	256	1	96%
small boulder	256	362	4	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

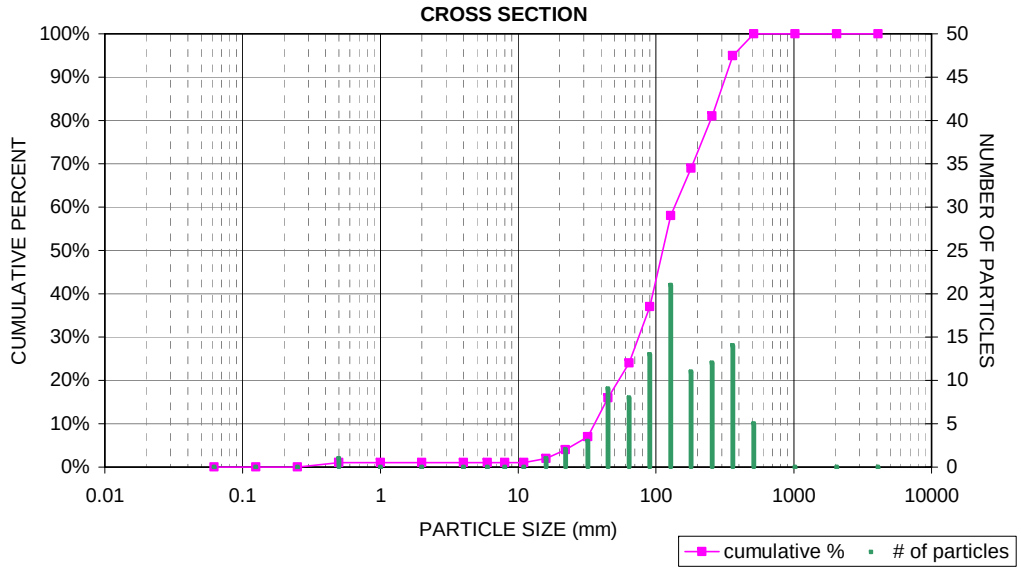


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
1.414	26.08	47.3	69	110	180	17.9	12.5	8.8

Pebble Count (Cross Section)

SITE ID: POCOCR15

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	1	1%
coarse sand	0.5	1	0	1%
very coarse sand	1	2	0	1%
very fine gravel	2	4	0	1%
fine gravel	4	6	0	1%
fine gravel	6	8	0	1%
medium gravel	8	11	0	1%
medium gravel	11	16	1	2%
coarse gravel	16	22	2	4%
coarse gravel	22	32	3	7%
very coarse gravel	32	45	9	16%
very coarse gravel	45	64	8	24%
small cobble	64	90	13	37%
medium cobble	90	128	21	58%
large cobble	128	180	11	69%
very large cobble	180	256	12	81%
small boulder	256	362	14	95%
small boulder	362	512	5	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

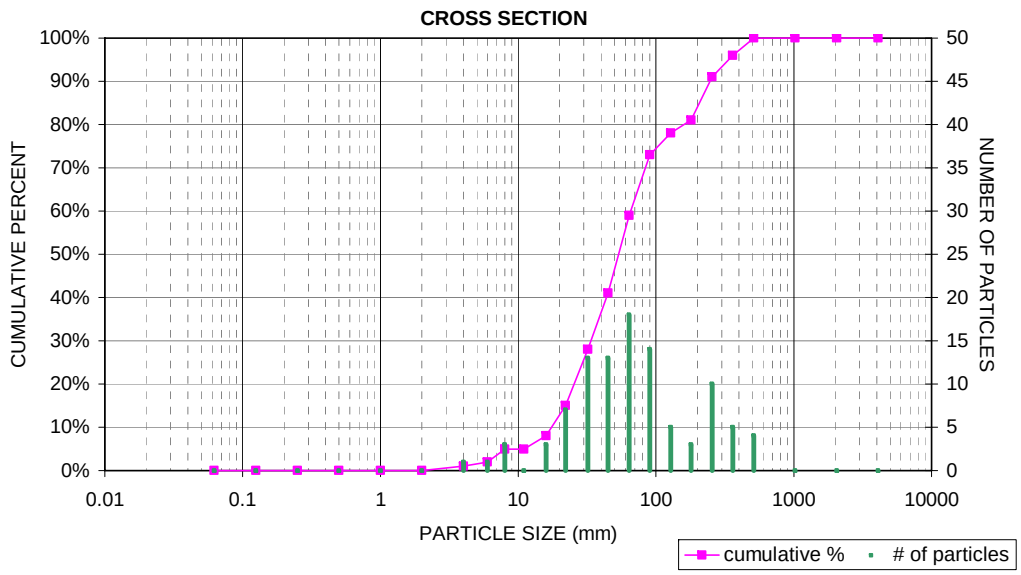


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
45.000	85.40	111.9	159	276	362	2.5	111.4	2.5

Pebble Count (Cross Section)

SITE ID: POCOCR18

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	1	1%
fine gravel	4	6	1	2%
fine gravel	6	8	3	5%
medium gravel	8	11	0	5%
medium gravel	11	16	3	8%
coarse gravel	16	22	7	15%
coarse gravel	22	32	13	28%
very coarse gravel	32	45	13	41%
very coarse gravel	45	64	18	59%
small cobble	64	90	14	73%
medium cobble	90	128	5	78%
large cobble	128	180	3	81%
very large cobble	180	256	10	91%
small boulder	256	362	5	96%
small boulder	362	512	4	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

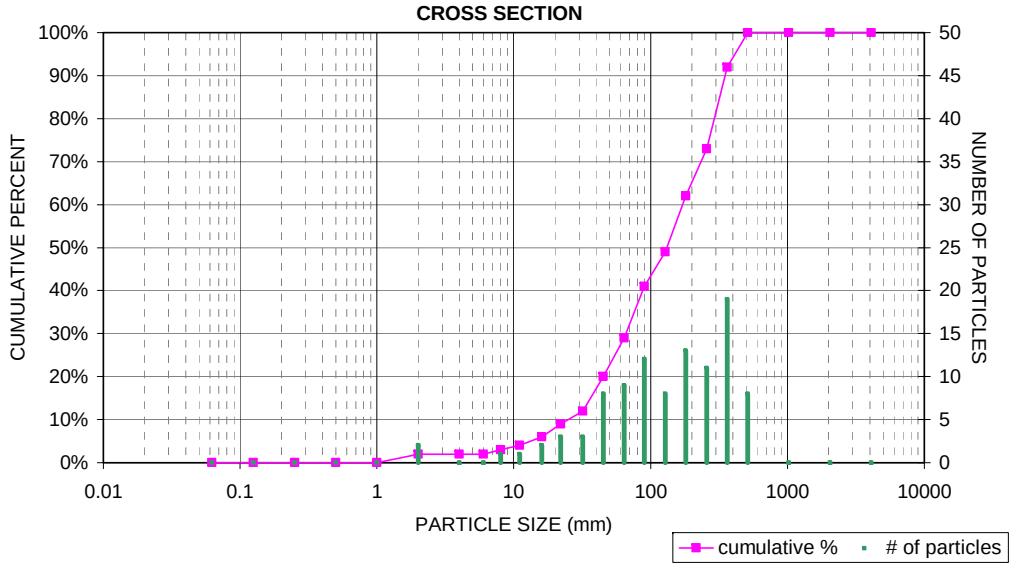


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
22.643	38.45	53.7	74	200	338	3.0	67.3	3.0

Pebble Count (Cross Section)

SITE ID: POCOCR22

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	2	2%
very fine gravel	2	4	0	2%
fine gravel	4	6	0	2%
fine gravel	6	8	1	3%
medium gravel	8	11	1	4%
medium gravel	11	16	2	6%
coarse gravel	16	22	3	9%
coarse gravel	22	32	3	12%
very coarse gravel	32	45	8	20%
very coarse gravel	45	64	9	29%
small cobble	64	90	12	41%
medium cobble	90	128	8	49%
large cobble	128	180	13	62%
very large cobble	180	256	11	73%
small boulder	256	362	19	92%
small boulder	362	512	8	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

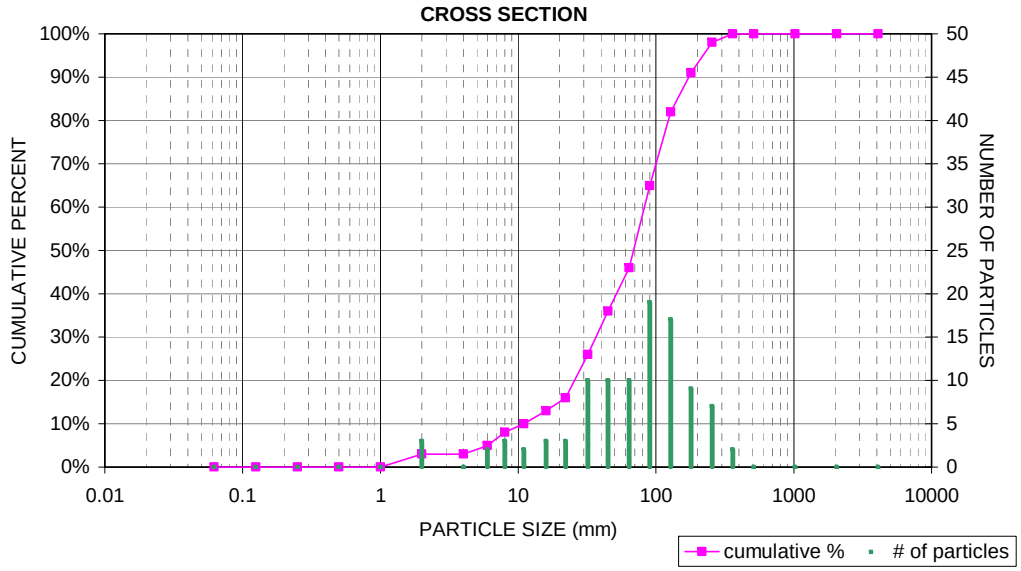


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
37.947	75.89	131.4	198	313	412	2.9	109.0	2.9

Pebble Count (Cross Section)

SITE ID: POCOCR14

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	3	3%
very fine gravel	2	4	0	3%
fine gravel	4	6	2	5%
fine gravel	6	8	3	8%
medium gravel	8	11	2	10%
medium gravel	11	16	3	13%
coarse gravel	16	22	3	16%
coarse gravel	22	32	10	26%
very coarse gravel	32	45	10	36%
very coarse gravel	45	64	10	46%
small cobble	64	90	19	65%
medium cobble	90	128	17	82%
large cobble	128	180	9	91%
very large cobble	180	256	7	98%
small boulder	256	362	2	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

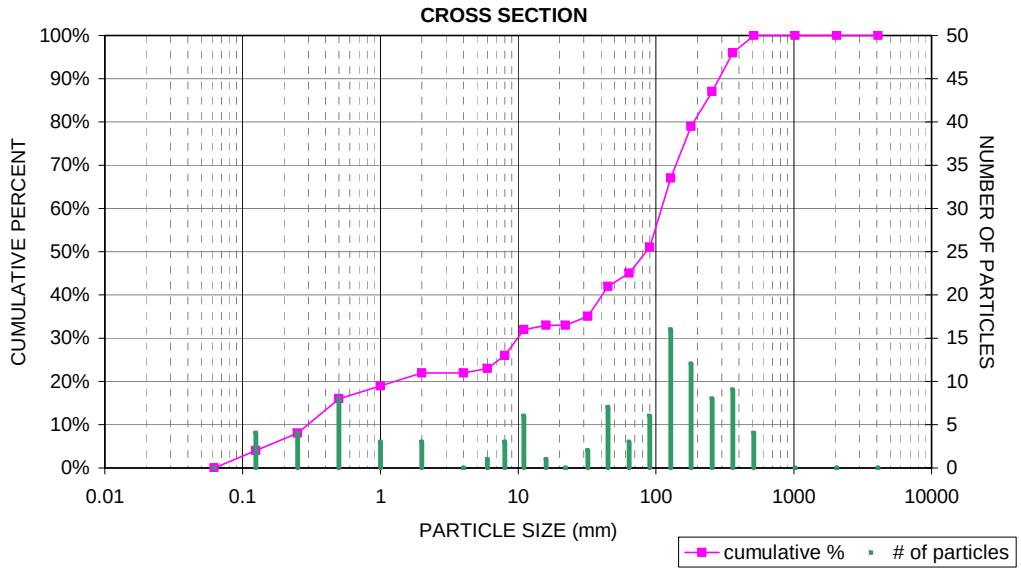


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
22.000	43.49	68.8	90	138	220	2.6	55.1	2.5

Pebble Count (Cross Section)

SITE ID: MCMICR21

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	4	4%
fine sand	0.13	0.25	4	8%
medium sand	0.25	0.5	8	16%
coarse sand	0.5	1	3	19%
very coarse sand	1	2	3	22%
very fine gravel	2	4	0	22%
fine gravel	4	6	1	23%
fine gravel	6	8	3	26%
medium gravel	8	11	6	32%
medium gravel	11	16	1	33%
coarse gravel	16	22	0	33%
coarse gravel	22	32	2	35%
very coarse gravel	32	45	7	42%
very coarse gravel	45	64	3	45%
small cobble	64	90	6	51%
medium cobble	90	128	16	67%
large cobble	128	180	12	79%
very large cobble	180	256	8	87%
small boulder	256	362	9	96%
small boulder	362	512	4	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

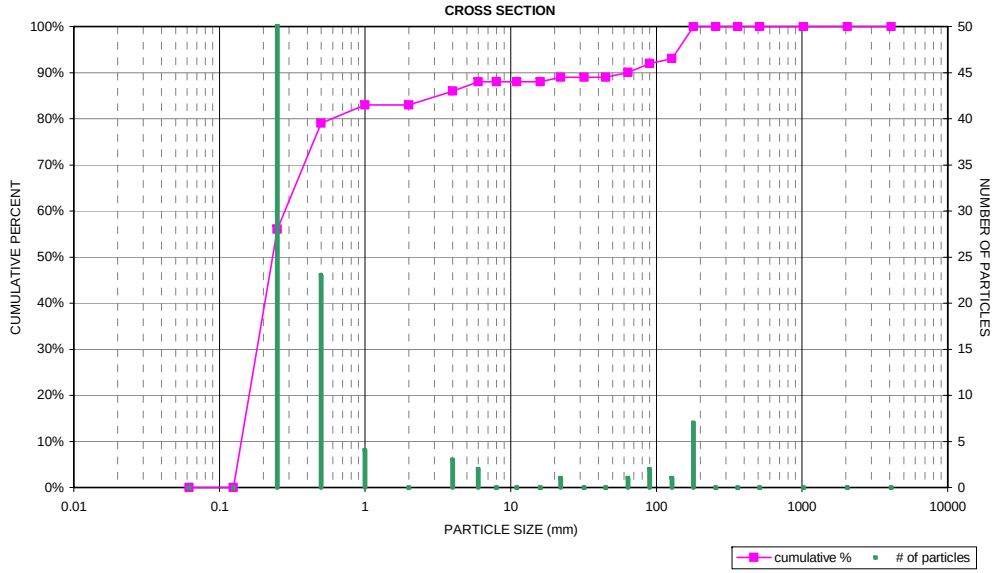


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
0.500	32.00	85.0	122	224	348	86.3	10.6	21.2

Pebble Count (Cross Section)

SITE ID: REDRU03

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	56	56%
medium sand	0.25	0.5	23	79%
coarse sand	0.5	1	4	83%
very coarse sand	1	2	0	83%
very fine gravel	2	4	3	86%
fine gravel	4	6	2	88%
fine gravel	6	8	0	88%
medium gravel	8	11	0	88%
medium gravel	11	16	0	88%
coarse gravel	16	22	1	89%
coarse gravel	22	32	0	89%
very coarse gravel	32	45	0	89%
very coarse gravel	45	64	1	90%
small cobble	64	90	2	92%
medium cobble	90	128	1	93%
large cobble	128	180	7	100%
very large cobble	180	256	0	100%
small boulder	256	362	0	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

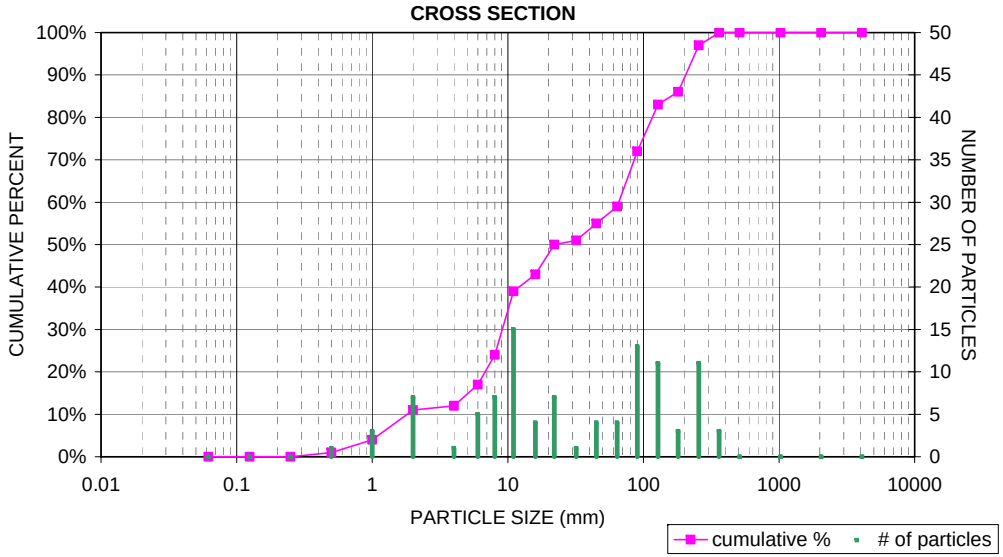


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
0.152	0.19	0.2	0	3	141	6.2	0.6	4.1

Pebble Count (Cross Section)

SITE ID: HAWKRU02

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	1	1%
coarse sand	0.5	1	3	4%
very coarse sand	1	2	7	11%
very fine gravel	2	4	1	12%
fine gravel	4	6	5	17%
fine gravel	6	8	7	24%
medium gravel	8	11	15	39%
medium gravel	11	16	4	43%
coarse gravel	16	22	7	50%
coarse gravel	22	32	1	51%
very coarse gravel	32	45	4	55%
very coarse gravel	45	64	4	59%
small cobble	64	90	13	72%
medium cobble	90	128	11	83%
large cobble	128	180	3	86%
very large cobble	180	256	11	97%
small boulder	256	362	3	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

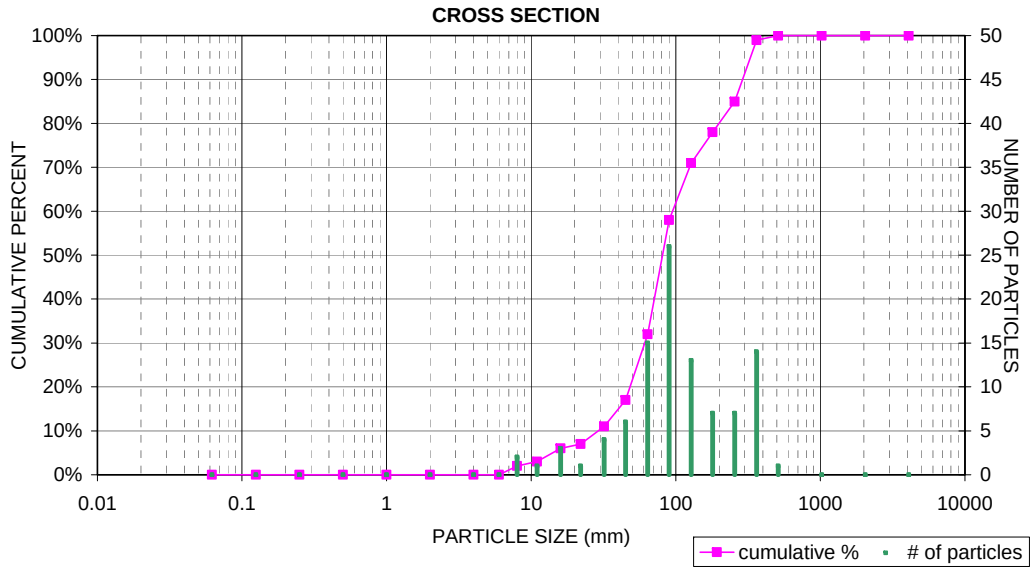


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
5.533	10.10	22.0	75	143	240	5.2	28.2	5.1

Pebble Count (Cross Section)

SITE ID:TROUCR03

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	0	0%
fine gravel	6	8	2	2%
medium gravel	8	11	1	3%
medium gravel	11	16	3	6%
coarse gravel	16	22	1	7%
coarse gravel	22	32	4	11%
very coarse gravel	32	45	6	17%
very coarse gravel	45	64	15	32%
small cobble	64	90	26	58%
medium cobble	90	128	13	71%
large cobble	128	180	7	78%
very large cobble	180	256	7	85%
small boulder	256	362	14	99%
small boulder	362	512	1	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

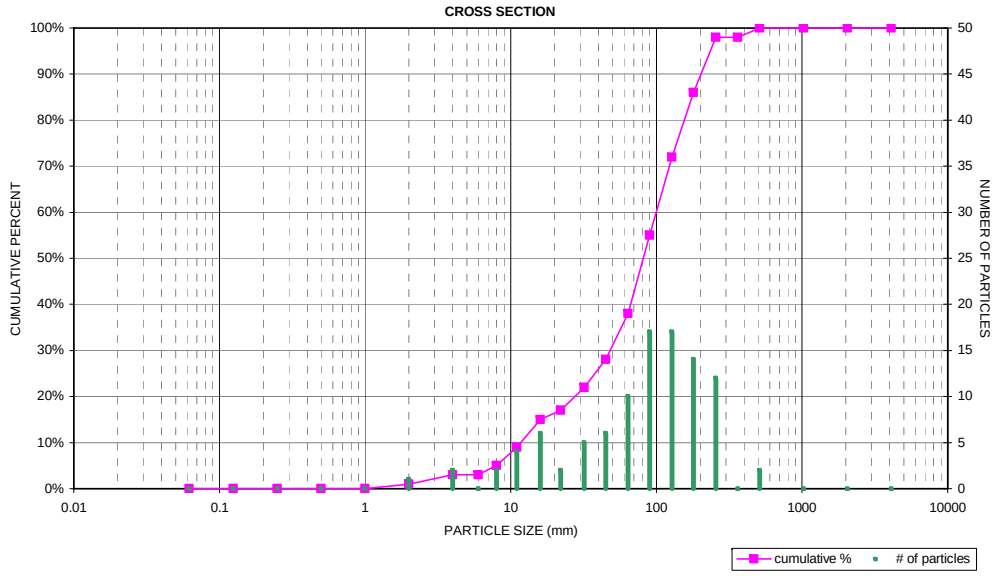


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
42.514	66.57	81.0	109	243	328	2.5	101.7	2.4

Pebble Count (Cross Section)

SITE ID: TOBYCR14

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	1	1%
very fine gravel	2	4	2	3%
fine gravel	4	6	0	3%
fine gravel	6	8	2	5%
medium gravel	8	11	4	9%
medium gravel	11	16	6	15%
coarse gravel	16	22	2	17%
coarse gravel	22	32	5	22%
very coarse gravel	32	45	6	28%
very coarse gravel	45	64	10	38%
small cobble	64	90	17	55%
medium cobble	90	128	17	72%
large cobble	128	180	14	86%
very large cobble	180	256	12	98%
small boulder	256	362	0	98%
small boulder	362	512	2	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

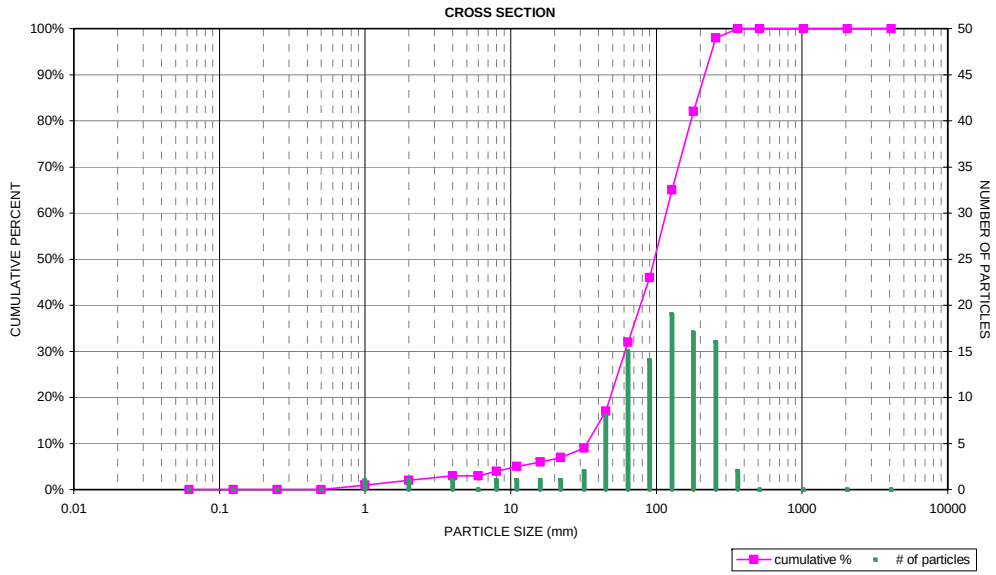


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
18.762	57.58	81.4	111	171	234	3.2	56.7	3.0

Pebble Count (Cross Section)

SITE ID: TUNKCR03

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	1	1%
very coarse sand	1	2	1	2%
very fine gravel	2	4	1	3%
fine gravel	4	6	0	3%
fine gravel	6	8	1	4%
medium gravel	8	11	1	5%
medium gravel	11	16	1	6%
coarse gravel	16	22	1	7%
coarse gravel	22	32	2	9%
very coarse gravel	32	45	8	17%
very coarse gravel	45	64	15	32%
small cobble	64	90	14	46%
medium cobble	90	128	19	65%
large cobble	128	180	17	82%
very large cobble	180	256	16	98%
small boulder	256	362	2	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

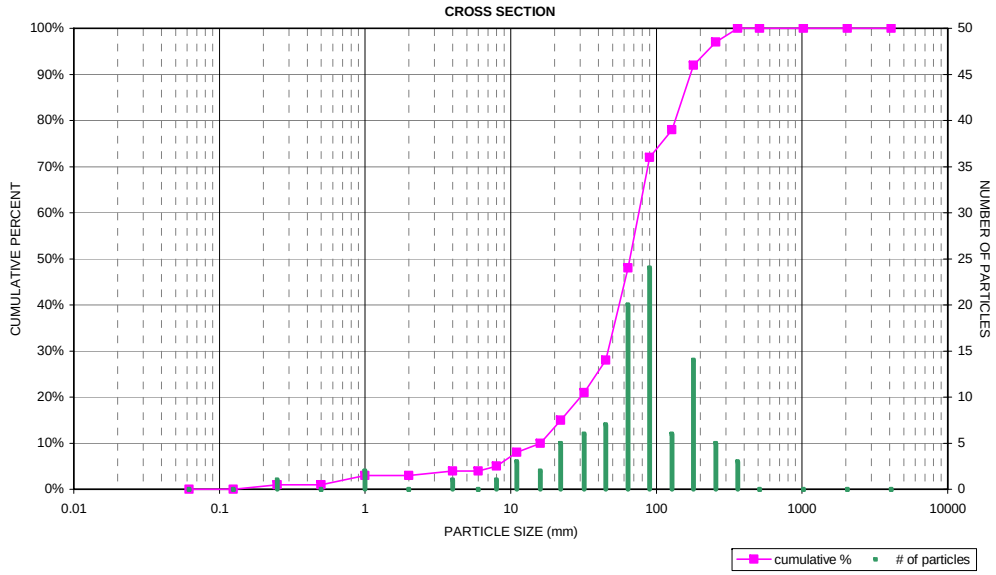


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
43.123	68.85	96.9	128	188	240	2.1	90.1	2.1

Pebble Count (Cross Section)

SITE ID:JONASCR01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	1	1%
medium sand	0.25	0.5	0	1%
coarse sand	0.5	1	2	3%
very coarse sand	1	2	0	3%
very fine gravel	2	4	1	4%
fine gravel	4	6	0	4%
fine gravel	6	8	1	5%
medium gravel	8	11	3	8%
medium gravel	11	16	2	10%
coarse gravel	16	22	5	15%
coarse gravel	22	32	6	21%
very coarse gravel	32	45	7	28%
very coarse gravel	45	64	20	48%
small cobble	64	90	24	72%
medium cobble	90	128	6	78%
large cobble	128	180	14	92%
very large cobble	180	256	5	97%
small boulder	256	362	3	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

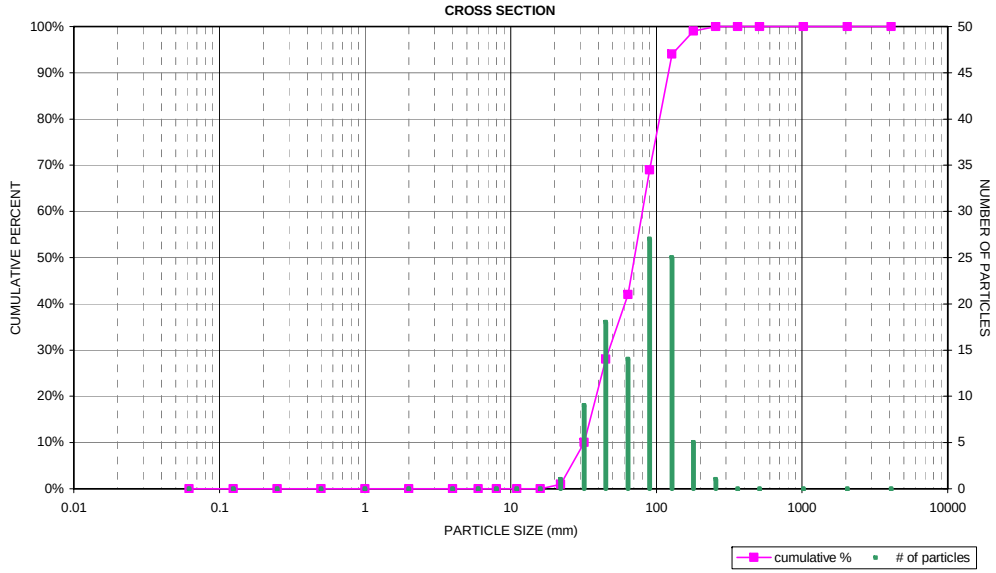


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
23.418	50.90	65.8	81	148	222	2.5	58.9	2.5

Pebble Count (Cross Section)

SITE ID:POHOCR08

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	0	0%
fine gravel	6	8	0	0%
medium gravel	8	11	0	0%
medium gravel	11	16	0	0%
coarse gravel	16	22	1	1%
coarse gravel	22	32	9	10%
very coarse gravel	32	45	18	28%
very coarse gravel	45	64	14	42%
small cobble	64	90	27	69%
medium cobble	90	128	25	94%
large cobble	128	180	5	99%
very large cobble	180	256	1	100%
small boulder	256	362	0	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

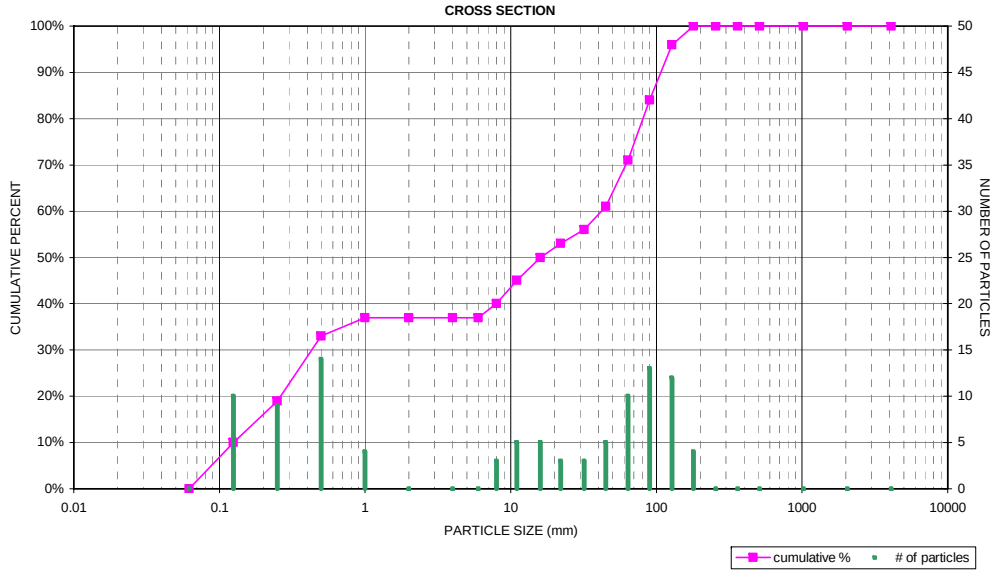


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
35.851	53.67	70.8	86	111	137	1.8	63.1	1.8

Pebble Count (Cross Section)

SITE ID:WEIRCR02

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	10	10%
fine sand	0.13	0.25	9	19%
medium sand	0.25	0.5	14	33%
coarse sand	0.5	1	4	37%
very coarse sand	1	2	0	37%
very fine gravel	2	4	0	37%
fine gravel	4	6	0	37%
fine gravel	6	8	3	40%
medium gravel	8	11	5	45%
medium gravel	11	16	5	50%
coarse gravel	16	22	3	53%
coarse gravel	22	32	3	56%
very coarse gravel	32	45	5	61%
very coarse gravel	45	64	10	71%
small cobble	64	90	13	84%
medium cobble	90	128	12	96%
large cobble	128	180	4	100%
very large cobble	180	256	0	100%
small boulder	256	362	0	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

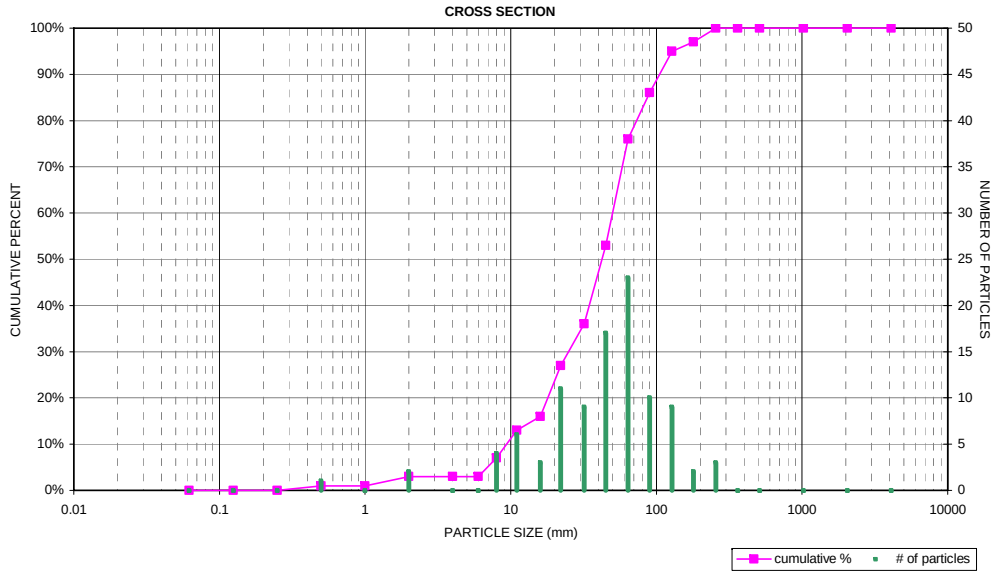


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
0.198	0.71	16.0	52	90	124	43.1	4.2	21.3

Pebble Count (Cross Section)

SITE ID: POHOCR06

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	1	1%
coarse sand	0.5	1	0	1%
very coarse sand	1	2	2	3%
very fine gravel	2	4	0	3%
fine gravel	4	6	0	3%
fine gravel	6	8	4	7%
medium gravel	8	11	6	13%
medium gravel	11	16	3	16%
coarse gravel	16	22	11	27%
coarse gravel	22	32	9	36%
very coarse gravel	32	45	17	53%
very coarse gravel	45	64	23	76%
small cobble	64	90	10	86%
medium cobble	90	128	9	95%
large cobble	128	180	2	97%
very large cobble	180	256	3	100%
small boulder	256	362	0	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

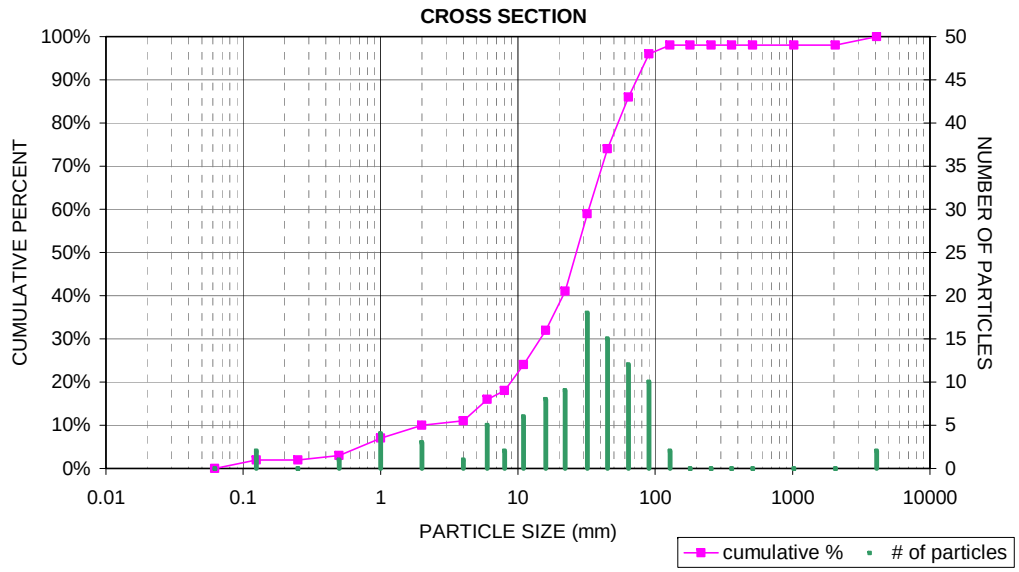


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
16.000	30.70	42.4	54	84	128	2.3	36.7	2.3

Pebble Count (Cross Section)

SITE ID:BUCKCR01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	2	2%
fine sand	0.13	0.25	0	2%
medium sand	0.25	0.5	1	3%
coarse sand	0.5	1	4	7%
very coarse sand	1	2	3	10%
very fine gravel	2	4	1	11%
fine gravel	4	6	5	16%
fine gravel	6	8	2	18%
medium gravel	8	11	6	24%
medium gravel	11	16	8	32%
coarse gravel	16	22	9	41%
coarse gravel	22	32	18	59%
very coarse gravel	32	45	15	74%
very coarse gravel	45	64	12	86%
small cobble	64	90	10	96%
medium cobble	90	128	2	98%
large cobble	128	180	0	98%
very large cobble	180	256	0	98%
small boulder	256	362	0	98%
small boulder	362	512	0	98%
medium boulder	512	1024	0	98%
large - very large boulder	1024	2048	0	98%
bedrock	2048	4096	2	100%
	Total Particle Count:		100	

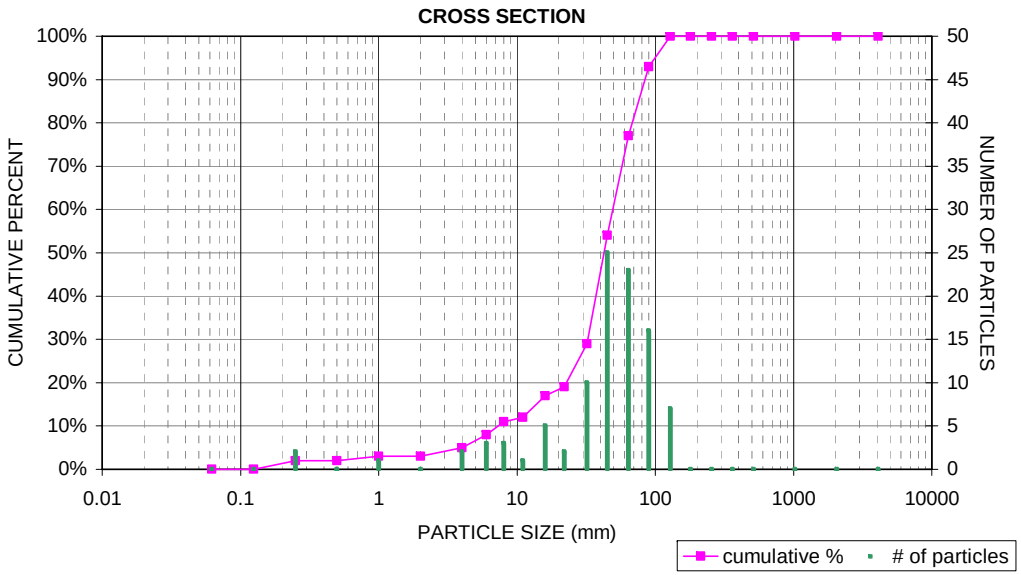


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
6.000	17.79	26.5	37	60	87	3.3	19.0	3.2

Pebble Count (Cross Section)

SITE ID:AQUACR09

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	2	2%
medium sand	0.25	0.5	0	2%
coarse sand	0.5	1	1	3%
very coarse sand	1	2	0	3%
very fine gravel	2	4	2	5%
fine gravel	4	6	3	8%
fine gravel	6	8	3	11%
medium gravel	8	11	1	12%
medium gravel	11	16	5	17%
coarse gravel	16	22	2	19%
coarse gravel	22	32	10	29%
very coarse gravel	32	45	25	54%
very coarse gravel	45	64	23	77%
small cobble	64	90	16	93%
medium cobble	90	128	7	100%
large cobble	128	180	0	100%
very large cobble	180	256	0	100%
small boulder	256	362	0	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

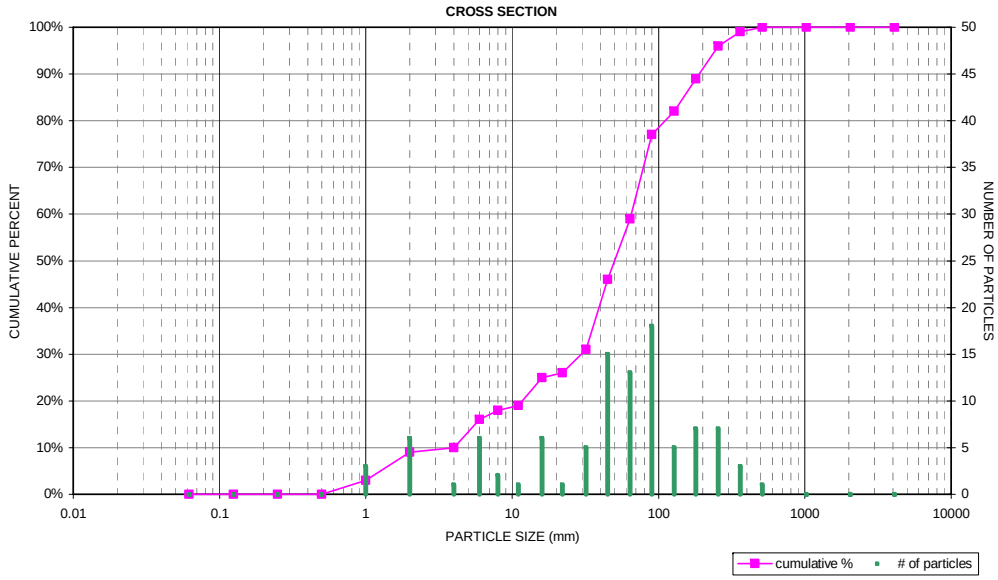


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
14.845	34.73	42.6	53	74	100	2.3	33.2	2.2

Pebble Count (Cross Section)

SITE ID:AQUACR10

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	3	3%
very coarse sand	1	2	6	9%
very fine gravel	2	4	1	10%
fine gravel	4	6	6	16%
fine gravel	6	8	2	18%
medium gravel	8	11	1	19%
medium gravel	11	16	6	25%
coarse gravel	16	22	1	26%
coarse gravel	22	32	5	31%
very coarse gravel	32	45	15	46%
very coarse gravel	45	64	13	59%
small cobble	64	90	18	77%
medium cobble	90	128	5	82%
large cobble	128	180	7	89%
very large cobble	180	256	7	96%
small boulder	256	362	3	99%
small boulder	362	512	1	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

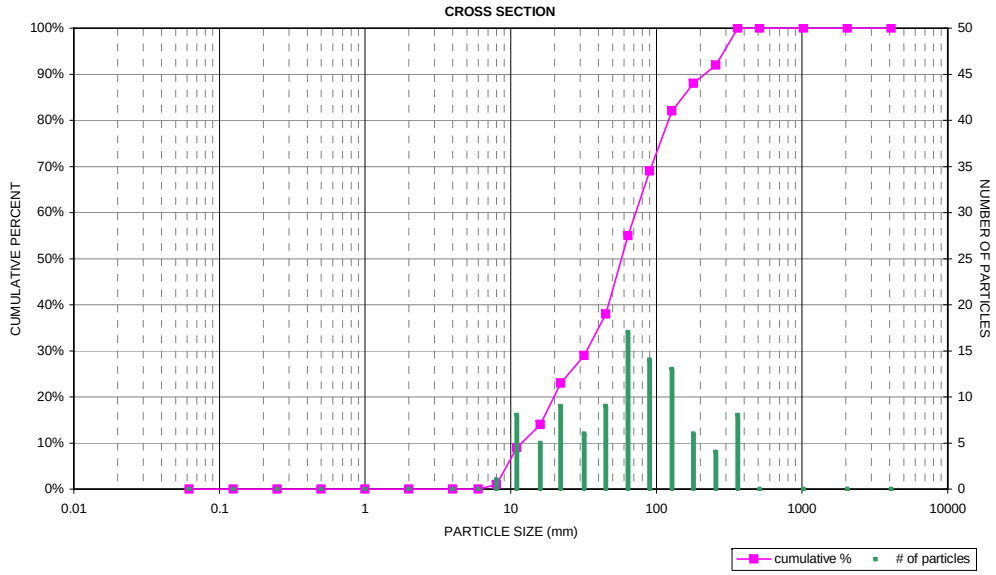


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
6.000	35.05	50.2	72	141	243	5.6	29.1	4.8

Pebble Count (Cross Section)

SITE ID:MARSCR08

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	0	0%
fine gravel	6	8	1	1%
medium gravel	8	11	8	9%
medium gravel	11	16	5	14%
coarse gravel	16	22	9	23%
coarse gravel	22	32	6	29%
very coarse gravel	32	45	9	38%
very coarse gravel	45	64	17	55%
small cobble	64	90	14	69%
medium cobble	90	128	13	82%
large cobble	128	180	6	88%
very large cobble	180	256	4	92%
small boulder	256	362	8	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

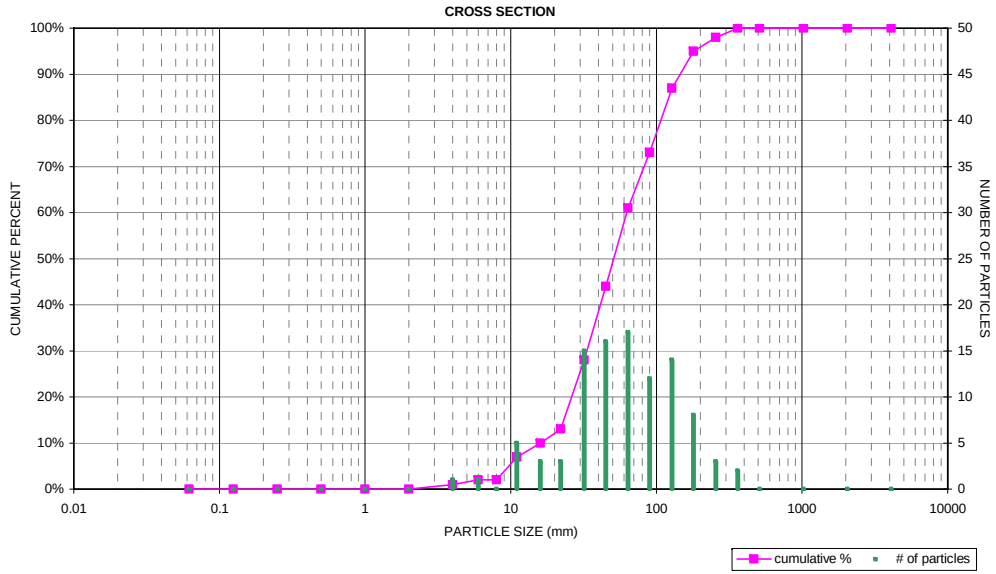


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
17.173	40.17	57.7	82	143	292	2.9	49.6	2.9

Pebble Count (Cross Section)

SITE ID:MARSCR09

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	1	1%
fine gravel	4	6	1	2%
fine gravel	6	8	0	2%
medium gravel	8	11	5	7%
medium gravel	11	16	3	10%
coarse gravel	16	22	3	13%
coarse gravel	22	32	15	28%
very coarse gravel	32	45	16	44%
very coarse gravel	45	64	17	61%
small cobble	64	90	12	73%
medium cobble	90	128	14	87%
large cobble	128	180	8	95%
very large cobble	180	256	3	98%
small boulder	256	362	2	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

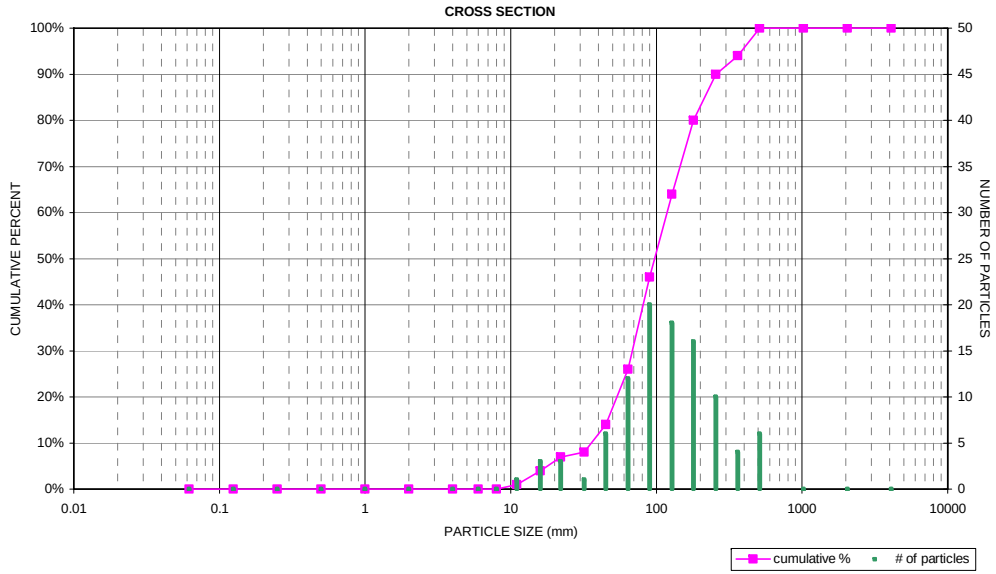


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
23.712	37.15	51.0	72	119	180	2.2	53.1	2.2

Pebble Count (Cross Section)

SITE ID:SAMBCR10

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	0	0%
fine gravel	6	8	0	0%
medium gravel	8	11	1	1%
medium gravel	11	16	3	4%
coarse gravel	16	22	3	7%
coarse gravel	22	32	1	8%
very coarse gravel	32	45	6	14%
very coarse gravel	45	64	12	26%
small cobble	64	90	20	46%
medium cobble	90	128	18	64%
large cobble	128	180	16	80%
very large cobble	180	256	10	90%
small boulder	256	362	4	94%
small boulder	362	512	6	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

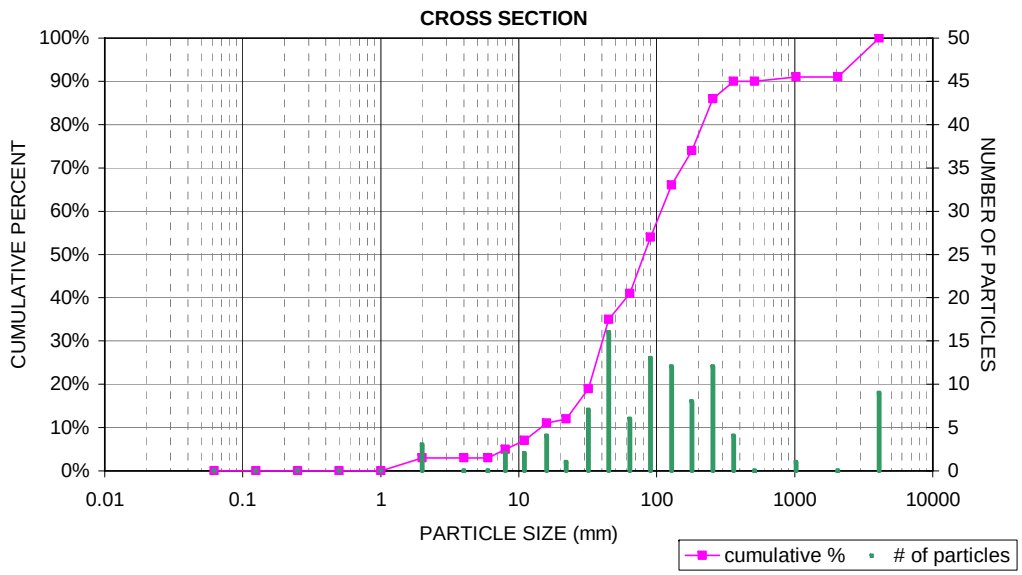


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
47.721	74.61	97.3	131	207	384	2.1	99.4	2.1

Pebble Count (Cross Section)

SITE ID: BRODCR14

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	3	3%
very fine gravel	2	4	0	3%
fine gravel	4	6	0	3%
fine gravel	6	8	2	5%
medium gravel	8	11	2	7%
medium gravel	11	16	4	11%
coarse gravel	16	22	1	12%
coarse gravel	22	32	7	19%
very coarse gravel	32	45	16	35%
very coarse gravel	45	64	6	41%
small cobble	64	90	13	54%
medium cobble	90	128	12	66%
large cobble	128	180	8	74%
very large cobble	180	256	12	86%
small boulder	256	362	4	90%
small boulder	362	512	0	90%
medium boulder	512	1024	1	91%
large - very large boulder	1024	2048	0	91%
bedrock	2048	4096	9	100%
		Total Particle Count:	100	

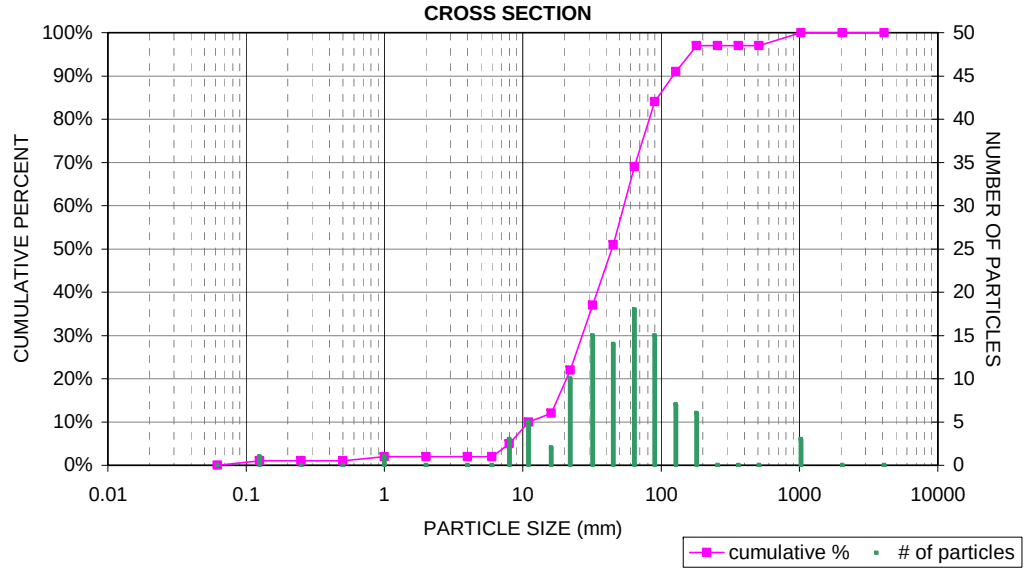


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
27.253	45.00	81.0	124	241	2787	3.0	81.1	3.0

Pebble Count (Cross Section)

SITE ID:BRODCR15

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	1	1%
fine sand	0.13	0.25	0	1%
medium sand	0.25	0.5	0	1%
coarse sand	0.5	1	1	2%
very coarse sand	1	2	0	2%
very fine gravel	2	4	0	2%
fine gravel	4	6	0	2%
fine gravel	6	8	3	5%
medium gravel	8	11	5	10%
medium gravel	11	16	2	12%
coarse gravel	16	22	10	22%
coarse gravel	22	32	15	37%
very coarse gravel	32	45	14	51%
very coarse gravel	45	64	18	69%
small cobble	64	90	15	84%
medium cobble	90	128	7	91%
large cobble	128	180	6	97%
very large cobble	180	256	0	97%
small boulder	256	362	0	97%
small boulder	362	512	0	97%
medium boulder	512	1024	3	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

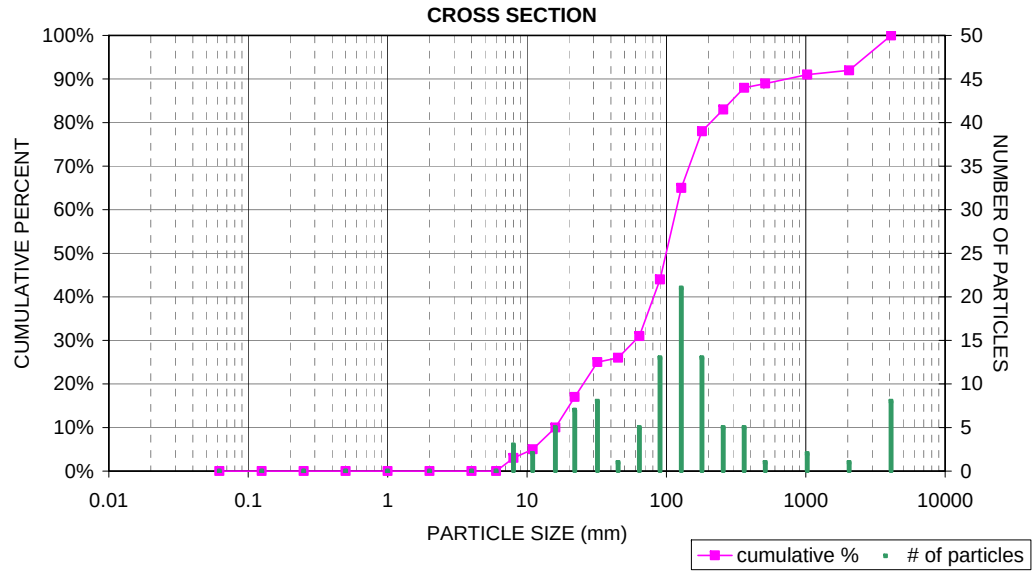


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
18.174	30.44	43.9	59	90	161	2.2	40.4	2.2

Pebble Count (Cross Section)

SITE ID:CRANCR01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	0	0%
fine gravel	6	8	3	3%
medium gravel	8	11	2	5%
medium gravel	11	16	5	10%
coarse gravel	16	22	7	17%
coarse gravel	22	32	8	25%
very coarse gravel	32	45	1	26%
very coarse gravel	45	64	5	31%
small cobble	64	90	13	44%
medium cobble	90	128	21	65%
large cobble	128	180	13	78%
very large cobble	180	256	5	83%
small boulder	256	362	5	88%
small boulder	362	512	1	89%
medium boulder	512	1024	2	91%
large - very large boulder	1024	2048	1	92%
bedrock	2048	4096	8	100%
		Total Particle Count:	100	

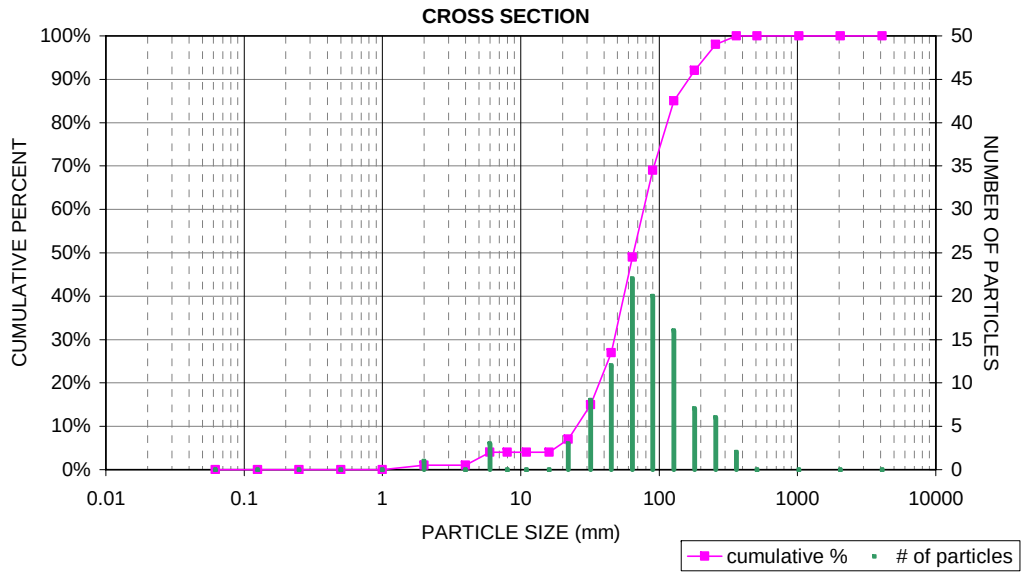


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
21.022	71.08	99.5	128	274	2656	3.7	75.9	3.6

Pebble Count (Cross Section)

SITE ID:MCMICR28

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	1	1%
very fine gravel	2	4	0	1%
fine gravel	4	6	3	4%
fine gravel	6	8	0	4%
medium gravel	8	11	0	4%
medium gravel	11	16	0	4%
coarse gravel	16	22	3	7%
coarse gravel	22	32	8	15%
very coarse gravel	32	45	12	27%
very coarse gravel	45	64	22	49%
small cobble	64	90	20	69%
medium cobble	90	128	16	85%
large cobble	128	180	7	92%
very large cobble	180	256	6	98%
small boulder	256	362	2	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

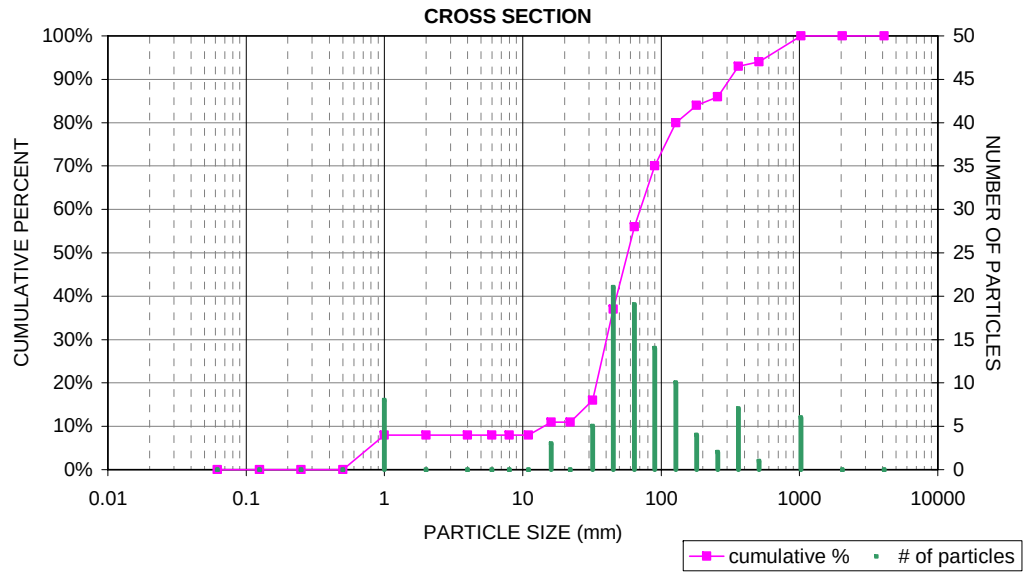


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
32.922	51.15	65.1	84	125	215	2.0	64.2	2.0

Pebble Count (Cross Section)

SITE ID:BRODCR01

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	8	8%
very coarse sand	1	2	0	8%
very fine gravel	2	4	0	8%
fine gravel	4	6	0	8%
fine gravel	6	8	0	8%
medium gravel	8	11	0	8%
medium gravel	11	16	3	11%
coarse gravel	16	22	0	11%
coarse gravel	22	32	5	16%
very coarse gravel	32	45	21	37%
very coarse gravel	45	64	19	56%
small cobble	64	90	14	70%
medium cobble	90	128	10	80%
large cobble	128	180	4	84%
very large cobble	180	256	2	86%
small boulder	256	362	7	93%
small boulder	362	512	1	94%
medium boulder	512	1024	6	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

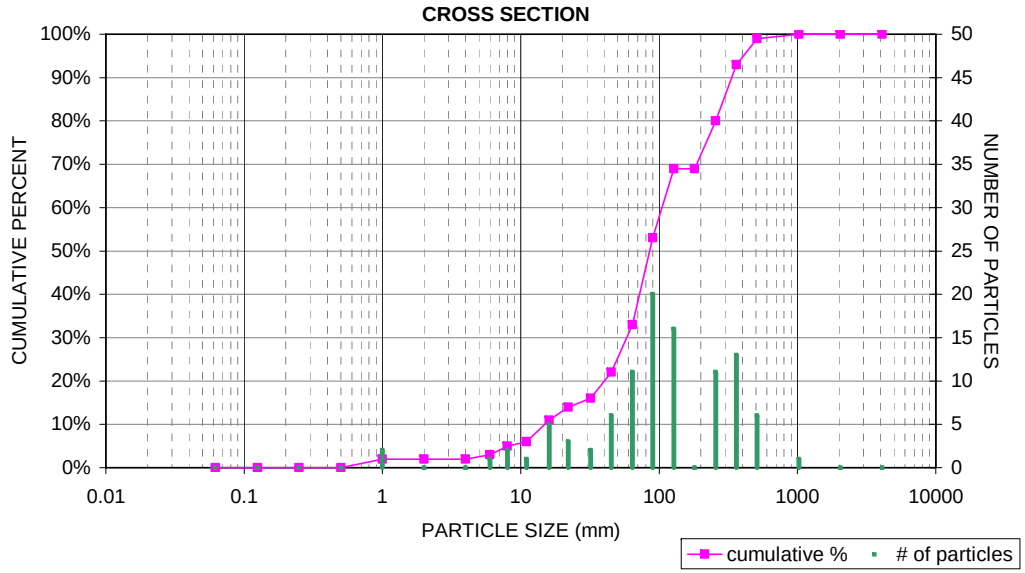


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
32.000	43.56	57.3	80	180	575	2.5	75.9	2.4

Pebble Count (Cross Section)

SITE ID:BRODCR12

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	2	2%
very coarse sand	1	2	0	2%
very fine gravel	2	4	0	2%
fine gravel	4	6	1	3%
fine gravel	6	8	2	5%
medium gravel	8	11	1	6%
medium gravel	11	16	5	11%
coarse gravel	16	22	3	14%
coarse gravel	22	32	2	16%
very coarse gravel	32	45	6	22%
very coarse gravel	45	64	11	33%
small cobble	64	90	20	53%
medium cobble	90	128	16	69%
large cobble	128	180	0	69%
very large cobble	180	256	11	80%
small boulder	256	362	13	93%
small boulder	362	512	6	99%
medium boulder	512	1024	1	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

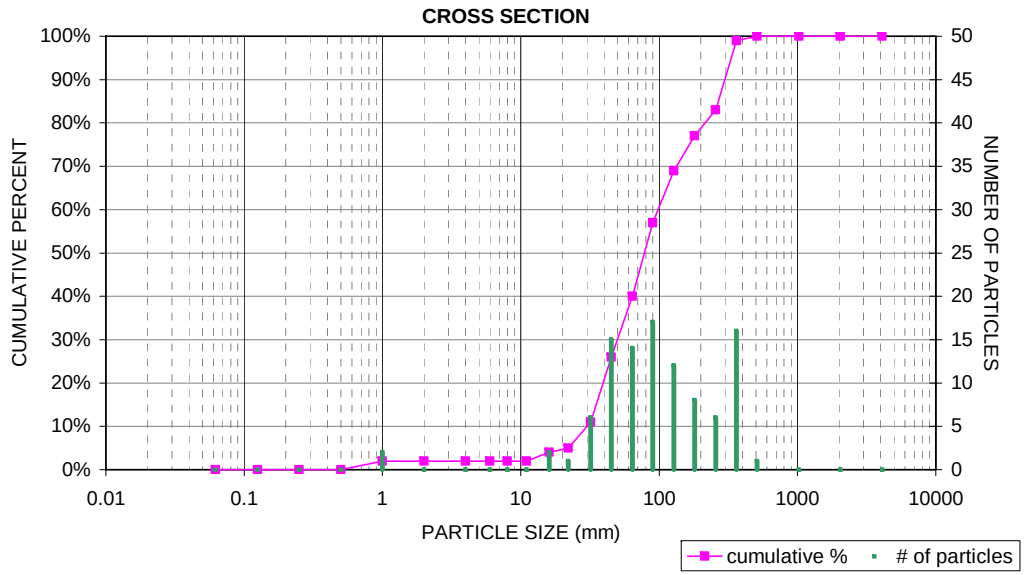


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
32.000	66.22	85.5	117	285	406	3.0	95.5	3.0

Pebble Count (Cross Section)

SITE ID:BUSHCR07

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	2	2%
very coarse sand	1	2	0	2%
very fine gravel	2	4	0	2%
fine gravel	4	6	0	2%
fine gravel	6	8	0	2%
medium gravel	8	11	0	2%
medium gravel	11	16	2	4%
coarse gravel	16	22	1	5%
coarse gravel	22	32	6	11%
very coarse gravel	32	45	15	26%
very coarse gravel	45	64	14	40%
small cobble	64	90	17	57%
medium cobble	90	128	12	69%
large cobble	128	180	8	77%
very large cobble	180	256	6	83%
small boulder	256	362	16	99%
small boulder	362	512	1	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
	Total Particle Count:		100	

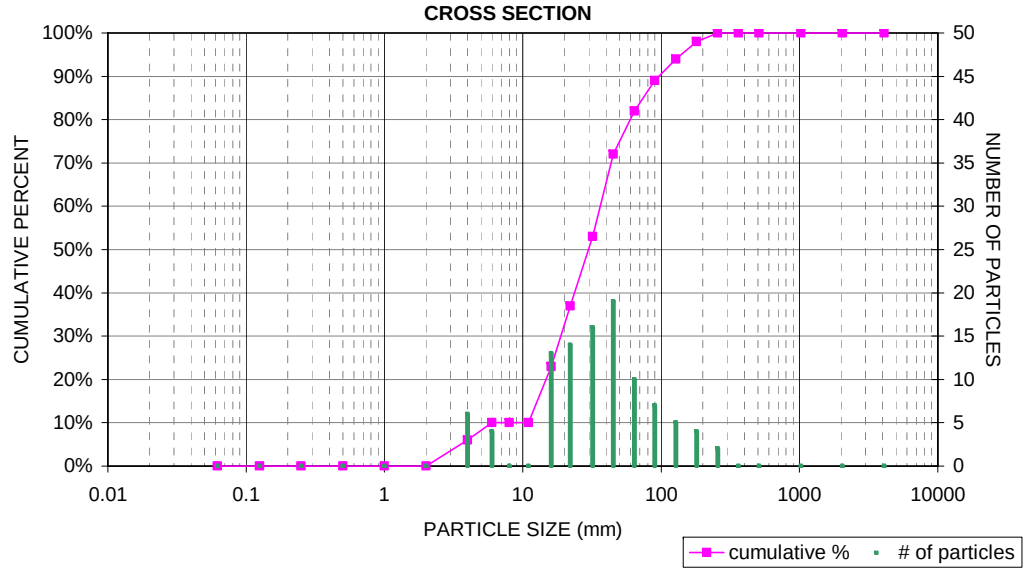


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
35.851	56.44	78.2	114	262	332	2.8	96.8	2.7

Pebble Count (Cross Section)

SITE ID:BRODCR13

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	6	6%
fine gravel	4	6	4	10%
fine gravel	6	8	0	10%
medium gravel	8	11	0	10%
medium gravel	11	16	13	23%
coarse gravel	16	22	14	37%
coarse gravel	22	32	16	53%
very coarse gravel	32	45	19	72%
very coarse gravel	45	64	10	82%
small cobble	64	90	7	89%
medium cobble	90	128	5	94%
large cobble	128	180	4	98%
very large cobble	180	256	2	100%
small boulder	256	362	0	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

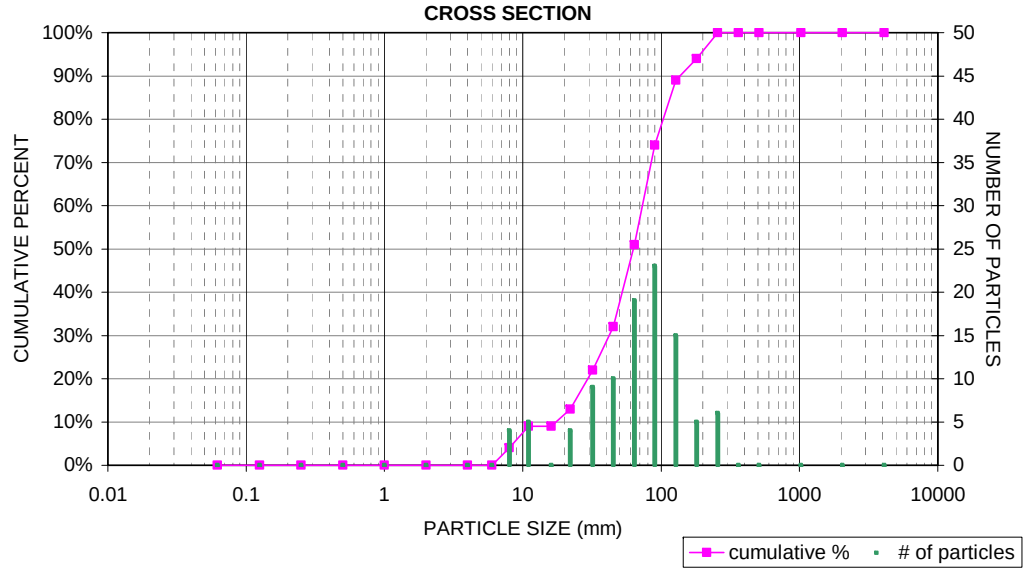


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
13.077	21.02	29.8	40	71	139	2.3	30.4	2.3

Pebble Count (Cross Section)

SITE ID:CHERCR11

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	0	0%
fine gravel	6	8	4	4%
medium gravel	8	11	5	9%
medium gravel	11	16	0	9%
coarse gravel	16	22	4	13%
coarse gravel	22	32	9	22%
very coarse gravel	32	45	10	32%
very coarse gravel	45	64	19	51%
small cobble	64	90	23	74%
medium cobble	90	128	15	89%
large cobble	128	180	5	94%
very large cobble	180	256	6	100%
small boulder	256	362	0	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	

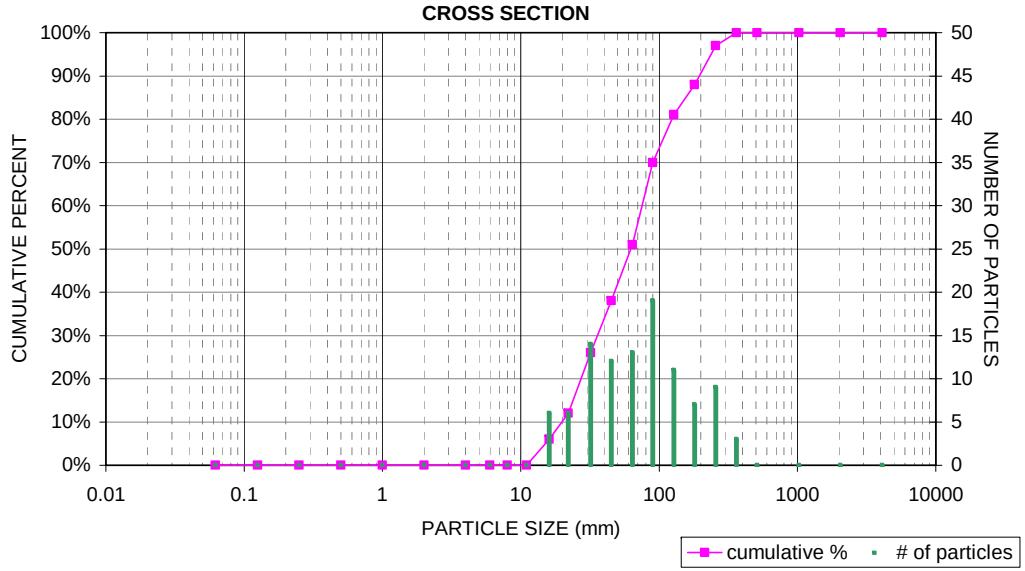


size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
24.927	47.57	62.8	79	114	191	2.2	53.3	2.1

Pebble Count (Cross Section)

SITE ID:MCMICR30

Material	Size Range (mm)		Particle Count	Cumulative Percent
silt/clay	0	0.062	0	0%
very fine sand	0.062	0.13	0	0%
fine sand	0.13	0.25	0	0%
medium sand	0.25	0.5	0	0%
coarse sand	0.5	1	0	0%
very coarse sand	1	2	0	0%
very fine gravel	2	4	0	0%
fine gravel	4	6	0	0%
fine gravel	6	8	0	0%
medium gravel	8	11	0	0%
medium gravel	11	16	6	6%
coarse gravel	16	22	6	12%
coarse gravel	22	32	14	26%
very coarse gravel	32	45	12	38%
very coarse gravel	45	64	13	51%
small cobble	64	90	19	70%
medium cobble	90	128	11	81%
large cobble	128	180	7	88%
very large cobble	180	256	9	97%
small boulder	256	362	3	100%
small boulder	362	512	0	100%
medium boulder	512	1024	0	100%
large - very large boulder	1024	2048	0	100%
bedrock	2048	4096	0	100%
		Total Particle Count:	100	



size percent less than (mm)						particle size distribution		
D16	D35	D50	D65	D84	D95	gradation	geo mean	std dev
24.486	41.32	62.3	82	148	237	2.5	60.2	2.5