Final Study Plan

for the

2012 Biological and Water Quality Survey

of the

East Fork Little Miami River Basin

Brown, Clermont, Clinton, and Highland Counties, Ohio

May 22, 2012

State of Ohio Environmental Protection Agency
Division of Surface Water
Lazarus Government Center
122 South Front St., Columbus, OH 43215
Mail to:
P.O. Box 1049, Columbus, OH 43216-1049

&
Monitoring and Assessment Section
4675 Homer Ohio Lane
Groveport, OH 43125
614-836-8796

&

Surface Water Section
Southwest District Office
401 East Fifth Street
Dayton, Ohio 45402

Geo-Referenced Site Labels

The sites listed in the study plan table are coded with STORET station IDs. These STORET IDs link data across several tables. They must be included on all field, lab and sample sheets and reported with all data results. Because the ECOS database needs to be maintained until the transition to EA3 is complete, and because various tables in ECOS lack a field for STORET IDs, the river mile, in concert with the rivercode, acts as the key relational field; ergo, the **exact river mile** listed in the study plan table must accompany all field, sample and lab sheets, and be reported with all results. If for some reason you sample at a location other than the one listed in the study plan, and that location is a trivial distance away from the one listed in the table and is fully representative of the STORET station, use the river mile listed in the study plan, and simply record the location information separately. An exact river mile can be assigned later to an Absolute Location Point (ALP) if warranted. If the location is not representative of the site listed on the study plan due to distance or a confounding factor, it should probably not be sampled, but if it is, it should be separated as a new station.

Background

The East Fork Little Miami River was last surveyed in 1998. That survey documented non-attainment of the Exceptional Warmwater Habitat designated aquatic life use throughout much of the East Fork mainstem due primarily to excessive sediment and nutrient enrichment. Nutrients and sediment, along with organic enrichment, were most frequently listed as causes of impairment to tributaries. Destruction of habitat due to sewer line construction along tributaries in the lower watershed during the mid-1990s also resulted in non-attainment.

Sentinel Sites

To aid in the development of a TMDL model(s), sentinel sites have been established at 13 locations (Table 1). At each sentinel site, samples are collected monthly beginning prior to the more encompassing survey that starts on June 15th. The purpose of the sentinel sites is to establish a baseline of water chemistry values under varying flow conditions. Stream stage is to be measured to the nearest hundredth of a foot as given by the water line against a designated bridge piling or abutment. Sampling events at sentinel sites should cover the range of stream flow from the 10th to 90th percentiles.

Aquatic Life Use Designations

Numerous streams (named and unnamed) within the study are presently not designated for aquatic life use. The Ohio EPA is obligated to review, evaluate, or recommend (where appropriate) beneficial uses prior to initiating any permitting actions to a water body. Waterbodies proposed for sampling with no existing aquatic life use are noted in Table 1.

NPDES Permitted Facilities

The portion of the East Fork Little Miami River watershed downstream from Lake Harsha is suburbanized and receives treated effluent from several major municipal wastewater treatment plants (WWTPs), as well as several mobile home parks. The portion of the watershed upstream from Lake Harsha is largely rural, but contains several minor municipal dischargers and mobile home parks, and a nursing home. Table 2 lists specific NPDES permitted facilities evaluated by this survey and includes summary information about each of those dischargers.

River Mile	STORET	SAMPLES	Drain Area	ROAD	Issue
11-100-000	***EAST FORK LMR***				
84.10	M04S17	C,m,f,N	3.0	SR 28	Upstream New Vienna WWTP
82.35	M04S35	B,C,m,f,N,D	5.4	Thornbird Road	Dst New Vienna WWTP (controlled discharge)
80.44	M04S16	C,m,f,N	12.8	SR 28	Trends
75.33	M04S15	B,Co,M,F,T,S,x,D	26.2	Canada Road	Trends
72.80	200506	C,M,F,N,T	48.0	EFK LMR ust Lynchburg WWTP	Ust Lynchburg WWTP
72.55	301883	B,C	48.2	LYNCHBURG WWTP	Effluent -design flow 0.5 MGD
70.90	M04S34	B,C,M,F,N	54.0	Wise Road	Dst Lynchburg WWTP (controlled discharge)
70.12	M04S14	C,M,F,N,D	88.0	Wise Road	Dst Lynchburg WWTP (far field)
63.40	200504	C,M,F,T	100.0	SR 251 (ust)	Trends
56.25	M04S13	B,C,M,F,Ns,D	151.0	US 50	Ust Fayetteville Perry Twp WWTP; Dst Solomon Run
54.42	M04S12	C,M,F,Ns,T,S,D	165.0	SR 131	Fayetteville Perry WWTP (discharge from trib @ RM 56.17)
46.92	301738	B,Co,M,F,Ns,x,D	178.0	Burdsall and SR 286	Trends
41.07	M04S10	C,M,F,Ns,S,D	221.0	Jackson Pike	Trends, Dst Pleasant Run (CECOS) and Fourmile Cr
35.87	M04S09	B,C,M,F,Ns,S,D	235.0	McKeever Road	Ust Williamsburg WWTP
35.25	M04W47	B,C	235.0	WILLIAMSBURG WWTP	Effluent
34.91	M04S08	B,Co,M,F,Ns,T,x,D	237.0	Main Street	Dst Williamsburg WWTP
19.50	M04S07	B,Co,Ns,x,D	343.0	Adj Elk Lick Rd	Dst Lake Harsha
15.60	M04S06	C,M,F,T,S	352.0	SR 222	Trends; WAU assessment
13.80	M04S31	B,C,M,F,N,T,D	363.0	SR 32	Ust Batavia WWTP
13.50	M04W19	B,C	364.0	BATAVIA WWTP	Effluent
13.18	M04S05	C,M,F,N,D	364.0	WWTP Access Road	Ust Middle E Fk Regional WWTP/Dst Batavia WWTP
12.60	M04W21	B,C	373.0	MIDDLE E FK WWTP	Effluent
11.50	M04S04	C,M,F,N,D	375.0	SR 222	Dst Middle East Fork Regional WWTP far field
9.10	M04S03	B,Co,M,F,N,x,D	380.0	Stonelick Road	Trends
5.60	M04W34	B,C,M,F,N,D	484.0	US 50	Ust Lower East Fork Regional WWTP

B-bacteria, C-chemistry, Co-organic scan, D- 48 hour Datasonde, M-quant, m-qual, F-2x, f-1x, N-nutrient site, Ns-include seston, S-sediment (reference sites), x-sentinel site, T-fish tissue

River Mile	STORET	SAMPLES	Drain Area	ROAD	Issue
11-100-000 EAST FORK LMR					
4.30	M04W38	C,M,F,N,T,D	491.0	Adj. SR 50	Dst Lower East Fork Regional WWTP
2.20	M04S29	C,M,F,N,D	494.0	SR 131 extention	Ust Milford STP
1.61	M04W43	B,C	497.0	MILFORD WWTP	Effluent
0.77	610530	B,Co,M,F,N,x,D	498.0	Cleveland and Roundbotttom	Dst Milford STP
11-100-001 TRIB TO EAST FK LMR (4.85)					
0.17	M04W36	B,C	0.6	LOWER E FK REGIONAL WWTP	Effluent
11-100-003 TRIB TO EAST FK LMR (78.45)					
0.50	M04P04	C,m,f,N	4.1	Rapid Forge Road	Unassessed, Dst Farmers (unsewered community)
11-100-006 TRIB TO EAST FK LMR (1.62)					
0.90	301914	C,m,f	2.6	Milford Road	Unassessed
11-100-007 GLADY CREEK					
0.70	301885	C,m,f	4.2	Wise Road	Unassessed
11-101-000 HALL RUN					
2.30	200481	C,m,f	3.1	Summerside Road	Sewer Lines
0.23	M04P13	C,m,f,N	5.5	Roundbottom Road	Sewer Lines
11-103-000 SALT RUN					
0.40	M99Q10	C,m,f,N	6.4	Roundbottom Road	Sewer Line/Historic
11-104-000 SUGARCAMP RUN					
0.17	M04P12	C,m,f	3.6	US 50	Trends

B-bacteria, C-chemistry, Co-organic scan, D- 48 hour Datasonde, M-quant, m-qual, F-2x, f-1x, N-nutrient site, Ns-include seston, S-sediment (reference sites), x-sentinel site, T-fish tissue

River Mile	STORET	SAMPLES	Drain Area	ROAD	Issue
11-105-000 SHAYLER RUN					
5.15	M04S38	C,m,f	4.9	SR 32	Trends/Sewer Line
11-105-000 SHAYLER RUN					
1.71	M04S37	B,Co,m,f,N,x,D	12.1	Baldwin Road	Trends/Sewer Line
11-105-001 TRIB TO SHAYLER RUN (4.40)					
0.40	M04S40	C,m,f	4.4	SR 32	Trends/Sewer Line
11-107-000 STONELICK CREEK					
20.00	200492	C,m,f	4.9	Woodville Road	Trends
17.72	M04S42	B,C,m,f,D	11.6	Stonelick Trail	Trends; Stonelick Lale
13.40	301905	B,C,M,F	23.0	SR 727	Dst Stonelick Lake; WAU assessment
9.84	M04S41	C,M,F,D	38.0	SR 131	Trends
6.20	301906	B,C,M,F	43.3	ANSTAETT RD (T-358)	Unassessed; WAU assessment
5.20	M99Q14	C,M,F	61.5	Quitter East Rd (off SR 132)	Unassessed
1.00	M04P09	B,Co,M,F,T,x,D,S	75.0	US 50	Sentinel
11-107-002 TRIB TO STONELICK CR (10.61)					
0.89	301148	B,Co,m,f,N	2.0	Cedarville Road	Trends/Unsewered (Newtonsville)
11-107-003 TRIB TO STONELICK CR (16.56)					
0.35	301908	C	4.0	SR 133	Stonelick Lake
11-107-004 LOCUST CREEK					
0.32	301907	C	3.2	SR 133	Stonelick Lake
11-108-000 LICK FORK					
0.60	200466	Co,m,f	6.3	CR 116	Trends

B-bacteria, C-chemistry, Co-organic scan, D- 48 hour Datasonde, M-quant, m-qual, F-2x, f-1x, N-nutrient site, Ns-include seston, S-sediment (reference sites), x-sentinel site, T-fish tissue

River Mile	STORET	SAMPLES	Drain Area	ROAD	Issue
11-109-000 BRUSHY FORK					
2.20	301911	C,m,f	5.7	Brushy Fork Road	Unassessed
11-109-000 BRUSHY FORK					
0.30	301912	C,m,f	14.8	Adj. Titus Road	Unassessed
11-111-000 PATERSON RUN					
0.10	301913	C,m,f	4.2	Brushy Fork Road	Unassessed
11-112-000 MOORES FORK					
2.90	301909	C,m,f	4.6	Meek Road	Unassessed
0.70	301910	C,m,f	10.6	Spring Hill Dr	Unassessed
11-115-000 BACKBONE CREEK					
0.60	301903	C,m,f	7.4	Old SR 132 (near 4552 SR 132)	Unassessed
11-115-001 TRIB TO BACKBONE CR (RM 1.36)					
0.90	301904	C,m,f,N	3.8	Elmwood Rd	Unassessed
11-116-000 LUCY RUN					
1.90	M04S44	C,m,f	3.7	Lucy Run Cemetery Road	Trends
0.10	M04S43	C,m,f,N	7.2	Adj. SR 222	Trends
11-117-000 FOURMILE RUN					
0.20	M99Q15	C,m,f,N	3.5	Elklick Rd	Biology only (chem by Clermont Co)
11-118-000 BACK RUN					
1.20	301902	C,m,f	2.4	Foozer Road	Unassessed

B-bacteria, C-chemistry, Co-organic scan, D- 48 hour Datasonde, M-quant, m-qual, F-2x, f-1x, N-nutrient site, Ns-include seston, S-sediment (reference sites), x-sentinel site, T-fish tissue

River Mile	STORET	SAMPLES	Drain Area	ROAD	Issue
11-119-000 ULREY RUN					
1.30	200497	C,m,f	3.5	SR 125/222	Trends
11-120-000 SLABCAMP RUN					
2.60	M04S45	C,m,f	0.7	Zagar Road	Lake Harsha
11-121-000 CLOVERLICK CREEK					
8.50	301898	C,m,f	12.4	Bethel New Hope	Unassessed
4.59	200468	B,Co,M,F,x,D	23.8	Ninnichuck Rd (or Austin Rd) off of 133	Sentinel
11-121-002 TRIB TO CLOVERLICK CR (7.48)					
0.60	301899	C,m,f	7.2	Spring Grove Rd	Unassessed
11-122-000 BARNES RUN					
1.90	200469	C,m,f	7.9	Concord-Bethel Road	Trends
11-123-000 POPLAR CREEK					
8.40	301900	C,m,f	5.8	Bethel Maple Road	Unassessed
2.10	200499	C,m,f,D	17.5	Macedonia Road	Unassessed
11-124-000 SUGARTREE CREEK					
0.60	301901	C,m,f	4.4	Campbell Road	Unassessed
11-132-000 KAIN RUN					
0.30	200471	C,m,f	5.9	Williamsburg-Bantam Road	Trends
11-133-000 TODD RUN					
1.00	200473	C,m,f	9.4	SR 133	Trends

B-bacteria, C-chemistry, Co-organic scan, D- 48 hour Datasonde, M-quant, m-qual, F-2x, f-1x, N-nutrient site, Ns-include seston, S-sediment (reference sites), x-sentinel site, T-fish tissue

River Mile	STORET	SAMPLES	Drain Area	ROAD	Issue
11-135-000 CRANE RUN					
0.20	301897	C,m,f	8.9	McKeever Road	Unassessed
11-136-000 FOURMILE CREEK					
0.30	301896	C,m,f	5.5	Jackson Road	Unassessed
11-137-000 PLEASANT RUN					
2.70	M04S47	Co,m,D	3.2	DST US 50	Upstream CECOS International Inc
1.35	M04S22	Co,m,f	5.3	Blue Sky Park Road	CECOS International Inc
0.42	M04S46	B,Co,m,f,x,D	7.8	Marathon Road	CECOS International Inc
11-138-000 FIVEMILE CREEK					
3.63	301895	C,m,f	8.3	Upper Fivemile West Road	Unassessed
0.50	M04S49	C,M,F,S	10.6	Blue Sky Park Road	Trends
11-141-000 HOWARD RUN					
0.20	301894	C,m,f	5.6	Burdsall	Unassessed
11-142-000 GRASSY FORK					
0.18	301345	C,m,f,D	6.3	Glancy Corner-Marathon Road	Trends
11-143-000 GLADY RUN					
0.75	M04W08	C,m,f	5.3	SR 131 (dst)	Lake Lorelei
11-144-000 SALTLICK CREEK					
0.10	301893	C,m,f	6.0	SR 131	Unassessed
11-145-000 INDIAN CREEK					
0.20	301892	C,m,f,N	3.9	US 68 & Howard Road	Unassessed

B-bacteria, C-chemistry, Co-organic scan,
D- 48 hour Datasonde, M-quant, m-qual,
F-2x, f-1x, N-nutrient site, Ns-include seston,
S-sediment (reference sites), x-sentinel site,
T-fish tissue

River Mile	STORET	SAMPLES	Drain Area	ROAD	Issue
11-147-000	***SOLOMON RUN***				
1.86	M04W05	C,m,f,N	6.1	Anderson State Road	Dst Saint Martin WWTP
11-147-001	***Murray Run***				
0.05	301927	m,f	3.2	Anderson State Road	Unassessed/Do based on recon (39.1940, -83.9241)
11-149-000	***SYCAMORE CREEK***				
0.80	200474	C,m,f	6.6	Glady Road	Unassessed
11-150-000	***W. FK. E. FK LMR***				
7.45	301891	C,m,f	8.2	Frazier Road	Unassessed, Blanchester PWS
0.12	M04S50	B,Co,M,F,S,x,D	28.3	SR 123	Trends
11-151-000	***DODSON CREEK***				
7.50	301886	C,m,f	5.07	Danville Road	Unassessed; Dst Russell (unsewered community)
5.83	301887	C,m,f	16.1	Gibler Road	Unassessed
0.05	M04S51	B,C,M,F,N,D,S	32.5	Farm Lane off SR 134)/Crampton Rd	Trends
11-151-001	***TRIB TO DODSON CREEK (4.52)***				
0.60	301890	C,m,f	4.9	US 50	Unassessed
11-153-000	***S. FK. DODSON CREEK***				
0.90	301888	C,m,f	2.3	Tedrick Road	Unassessed
11-153-001	***TRIB TO S. FK DODSON CR (0.37)***				
0.90	301889	C,m,f	6.5	Danville Road	Dst Fairview (unsewered community)and Hansen Aggregates
11-154-000	***TURTLE CREEK***				
5.90	301884	C,m,f	5.6	Panhandle Road	Unassessed
4.40	200508	C,m,f	13.7	Bald Knob Road	Trends; Upst Martin Marietta Quarry (3818 SharpsvilleRd)
1.20	M04S52	B,Co,m,f,x,D	17.2	Rammel Road	Trends; Dst Martin Marietta Quarry (3818 Sharpsville Rd)

B-bacteria, C-chemistry, Co-organic scan,
D- 48 hour Datasonde, M-quant, m-qual,
F-2x, f-1x, N-nutrient site, Ns-include seston,
S-sediment (reference sites), x-sentinel site,
T-fish tissue

Table 2. NPDES dischargers covered by the 2012 Integrated Biological and Water Quality Survey of the East Fork Little Miami River basin.

Plant	NPDES	Discharge RM	Average Design Flow	Median (2006-2011)	Max (2006-2011)
New Vienna	1PA00005	EFLMR @ 83.6	0.085	0.43	1145
Lynchburg	1PB00105	EFLMR @ 72.3	0.25	0.16	1.24
Locust Ridge Nursing Home	1PX00059	Light Run @ 2.3	0.01		
Fayetteville Perry Twp.	1PD00024	EFLMR @ 56.17 via trib	nd		
Williamsburg	1PB00034	EFLMR @ 36.5	0.5	0.27	157
Batavia	1PB00001	EFLMR @ 13.4	0.236	0.22	1.99
Middle East Fork	1PK00010	EFLMR @ 12.6	7.2	3.11	11.83
Lower East Fork	1PK00009	EFLMR @ 4.9 via trib	9.0	6.22	15.86
Milford	1PC00005	EFLMR @ 1.5	1.2	0.70	7.49
Royal Hills MHP	1PV00074	Happy Hollow @ 2.8	0.037		
Orchard Lake MHP	1PV00009	Happy Hollow headwater	0.042		
Holly Towne MHP	1PV00002	Back Run @ 2.0	0.035		
Forest Creek MHP	1PV00034	Ulrey Run @ 2.0	0.04		
Clermont Local Schools	1PT00077	Patterson Run @ 1.0	0.04		
CECOS International Inc	1IN00123	Pleasant Run	na		

Total Maximum Daily Load (TMDL)
Information collected as part of this survey will support TMDL development for the study area. The objectives of the TMDL process are to estimate pollutant loads from the various sources within the basin, define or characterize allowable loads to support beneficial uses, and to allocate pollutant loads among different pollutant sources through appropriate controls (e.g., NPDES permitting, storm water management, 319 proposals, NPS controls or other abatement strategies).

The components of the TMDL process supported by this survey are primarily the identification of impaired waters, verification (and redesignating if necessary) of beneficial use designations, gathering ambient information that will factor into the wasteload allocation, and ascribing causes and sources of use impairment. These data are necessary precursors to the development of effective control or abatement strategies (e.g., NPDES permitting, storm water management, 319 proposals, NPS controls or other abatement strategies).

Special Issues
Nutrients
Based on information reported in the Ohio 2002 Integrated Water Quality Monitoring and Assessment Report, nutrient enrichment was listed as a cause of impairment to most of the mainstem, and various tributaries. To help evaluate the potential for continued, new, or abated nutrient impairment, additional analyses are being requested. Specifically, benthic and/or water column chlorophyll a samples should be collected twice during the summer during stable baseflow conditions. Optimally, those samples should be collected in concert with the deployment of automated data loggers that record hourly dissolved oxygen, pH, temperature and conductivity. Additionally, samples for analysis of 5-day biological oxygen demand and alkalinity should, at a minimum, accompany the water column chlorophyll a samples collected from the East Fork LMR mainstem, and optimally be collected during each of the chemical sampling runs. Alkalinity is requested at all chlorophyll sites, but 5-day BOD is only necessary at sestonic sites.

Contacts

Bob Miltner (EAS Fish)	614-836-8796
Ed Moore (EAS Bugs/TSD Coordinator)	614-836-8785
Diana Zimmerman (District WQ Supervisor)	937-285-6440
Paul Gledhill (CO Modeling)	614-644-2881
Mary Mahr (District WQ)	937-285-6104
Louise Snyder (District WQ)	937-285-6475
Michelle Waller (District NPDES)	937-285-6454
Ron Ware (District NPDES)	937-285-6098
Hugh Trimble (District NPS)	937-285-6444
Gregg Sablak (TMDL Coordinator)	614-644-4132
Heather Lauer (PIC)	614-728-0039

Projected Sample Totals

Bacteria E. coli	Water column chemistry & field parameters	Water column organic scan 18 sites x 2 runs	Sondes	Fish (passes)	Bugs Quant	Bugs Qual	Sediment (assumes 1 sample per site) Metals Organics TOC Particle Size	Tissue (sites)	Chla 7 wc x1 filters x2 passes 35 rock x 1 filters x 2passes 16 field blanks
290	582	42		116	29	61	8	10	100
extra samples based on recon				+1		+1			

Wildlife Officers in the Study Area

Brown Eric Lamb
(937) 372-5639 X5220

Clermont Michael Ohlrich
(937) 372-5639 X5209

Clinton Matthew Roberts
(937) 372-5639 X5206

Highland Jim Carnes
(937) 372-5639 X5214

Area Hospitals/Emergency Rooms

Mercy Hospital Clermont
3000 Hospital Drive (off SR 32)
Batavia, OH
(513) 732-8278

Highland District Hospital
1275 North High Street (US 62)
Hillsboro, OH
(937) 393-6100

Doctors Urgent Care Office
935 SR 28
Milford, OH
(513) 831-8555

Maps on following pages…

batavia hospital ohio - Google Maps

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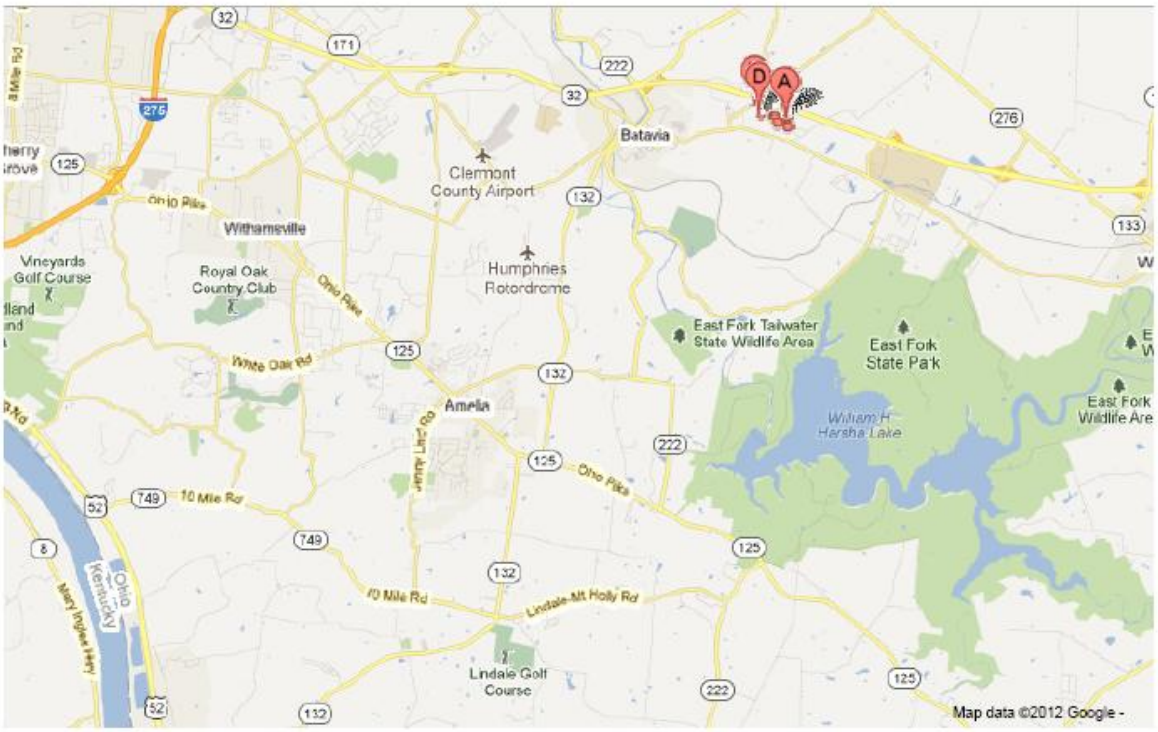

Highland District Hospital, North High Street, Hillsboro, OH - Google Maps

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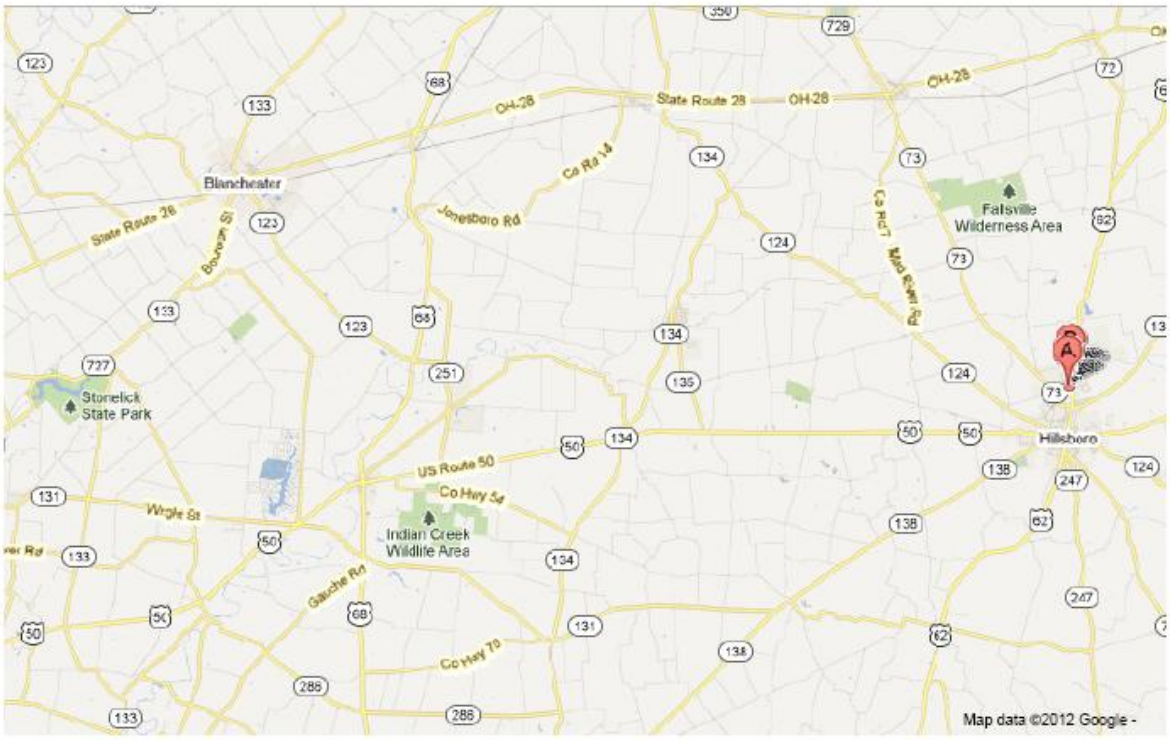

Doctors Urgent Care Office, Ohio 28, Milford, OH - Google Maps

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