2010 Study Plan

Central Ohio River Tribs (CORT) Watershed

Including the
Cross Creek, Short Creek and Wheeling Creek Basins

(Harrison, Jefferson, Belmont Counties, OH)

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Its nature's way of telling you, something's wrong

Spirit, *Nature's Way*
1970

Introduction

As part of the five-year basin approach for NPDES permitting and the TMDL process, an intensive chemical, physical, and biological sampling assessment of the Central Ohio River Tributaries (CORT) Cross/Short/Wheeling Watershed will be conducted during the 2010 field sampling season (July - October). The study area will include the entire Cross Creek, Short Creek, and Wheeling Creek basins and direct Ohio River tributaries between Empire and Bridgeport. The survey encompasses three, 10 digit HUC units ((0503010110, 0503010602, 0503010603) and a small portion of HUC 0503010612 (*i.e.,* the Rush Run and Salt Run watersheds).

As a rule, selected survey sampling sites equaled or exceeded 8 sq. miles in drainage area. However, in order to provide adequate sample coverage at the HUC 12 level or to assess issues of special interest (*e.g.,* point source discharges on small streams, out of date and unverified aquatic life use designations), additional sampling in some smaller drainages was included.

Sampling will be conducted at a total of 74 stations in the CORT basin and includes the following:

- Ambient biology (fish and macroinvertebrate), and macrohabitat quality (QHEI) from 71 sites as follows:
  1) Fish = 21 2x pass sites; 48 1x pass; 1 site TBD (poss. PHWH)
  2) Macroinvertebrates = 23 Quant. sites; 48 Qual. sites
  3) QHEI @ all fish sites
- Water column chemistry from 68 sites,
- Bacteriological sampling from 25 sites,
- Datasonde© continuous monitors from 25 sites,
- Sediment chemistry from 23 sites,
- Effluent sampling at the Cadiz WWTP and,
- Fish tissue samples collected at three Cross Creek sites downstream from the old Saltralloy plant near Steubenville.

A list of NPDES dischargers in the study area can be found in Table 1 (in progress). A complete list of field sampling stations and detailed descriptions of site locations can be found in the Table 2.

Sampling Objectives

1. Systematically sample and assess CORT watershed streams in support of the TMDL process,
2. Gather ambient environmental information (biological, chemical, and physical) from designated water bodies, to assess current beneficial uses (e.g., aquatic life, recreational, water supply), see Table 2, last column;
3. Collect fish tissue samples at selected stations;
4. Verify the appropriateness of existing, unverified, Beneficial Use Designations;
5. Establish baseline ambient biological conditions at previously unassessed stations to evaluate the effectiveness of future pollution abatement efforts;
6. Document any changes in the biological, chemical, and physical conditions of the study areas where historical information exists, thus expanding the Ohio EPA data base for statewide trends analysis (e.g., 305[b]), and
7. Assess the effectiveness of AMD Reclamation efforts.

Total Maximum Daily Load (TMDL)

Information collected as part of this survey will support TMDL development for the study areas. 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 the various 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.

Components of the TMDL process supported by this survey are identification of impaired waters, verification (and re-designation as necessary) of beneficial use

designations, and sources of use impairment. These data are necessary precursors to the development of effective control or abatement strategies.

Aquatic Life Use Designations

Many streams contained within the study area were designated Limited Warmwater Habitat (*L) in the original 1978 Ohio Water Quality Standards (WQS). These mine impacted streams received an exemption for Total Dissolved Solids (TDS) a common mine drainage related chemical parameter. The *L designation was later ruled illegal by USEPA, requiring affected streams to be re-assessed and redesignated when the watersheds came up in the State of Ohio basin assessment rotation. In addition, the entire Cross Creek basin upstream from McIntyre Creek received a Coldwater Habitat designation (*C) in the original WQS based on ODNR trout stocking activity. Subsequent Ohio EPA surveys determined the use was inappropriate in the Cross Creek mainstem and other Cross Creek tributaries sampled biologically. However, unverified coldwater habitat designations remain in several, still unassessed tributaries, particularly in the McIntyre Creek basin. Whenever possible, these streams will be evaluated in 2010 to confirm or rebut the old designation.

A considerable amount of habitat alteration and AMD reclamation, either by government, the mining industry, or natural attenuation has taken place since the last intensive basin survey was conducted in 1983. Much of the sampling effort in 2010 is allocated to evaluate changes in chemical and biological condition and the accuracy of the existing beneficial use designations.

Sampling Activities

Sentinel Site Monitoring

Typically, Ohio EPA sampling occurs within the critical low flow period of the year during the summer season when the attainment status for biological water quality criteria can be assessed. However, recognizing the impact of non-point pollution sources on streams and the lack of water chemistry data available under varying flow and seasonal conditions, Ohio EPA developed a “sentinel site” approach in an effort to develop data sets over an annual period of varying climatic and flow conditions. In addition to assisting in the analysis of causes and sources of any observed non-attainment, the resulting data set supports water quality modeling efforts for pollutants where total maximum daily loads (TMDLs) may be necessary.

Sentinel site selection is based on several factors including proximity to the watershed boundary, drainage area size (≥ 20 mi2), and varying land use (urban,

agricultural, etc). If possible, locations are selected that have USGS flow stations. Typically, however, bridge to water measurements are taken at each site using a weighted tape in conjunction with periodic instream flow measurements in order to develop predictive gage height to stream flow relationships.

The Cross/Short/Wheeling survey includes 12 extended sampling Sentinel Sites scattered throughout the study area; the locations are listed under the "Purpose" column in Table 2.

Chemical/Physical Water and Sediment

Chemical sampling locations within the study area are listed in Table 2. Conventional chemical/physical water quality samples will be collected 5 times at the 68 designated locations during the summer field season while additional sampling (up to 15x) will be conducted at the 12 Sentinel sites included in the total. Sediment samples will be collected at 23 locations. Datasonde© continuous monitors will be deployed at 25 locations, particularly in mine influenced sections of the Wheeling Creek and Short Creek basins, to monitor ph and TDS levels. Chemical parameters to be tested and lab test methodologies are listed in Table 3. Surface water sampling will occur across a variety of flow conditions, from lower flows to moderate and higher flows.

Bacteriological Sampling

Water samples will be collected for bacteriological analyses at 12 Sentinel Sites and 13 additional survey sites (Total = 25) to determine the attainment status of the Primary Contact recreational use in the CORT survey area. Testing will include *Escherichia coli* (E. coli) bacteria. Each site will be sampled a minimum of five times with expanded sampling conducted 10-12 times at Sentinel sites. Samples will be collected during the recreational season, between May 1st and October 30th.

Macroinvertebrate and Fish Assemblages

Macroinvertebrates will be sampled at sites listed in Table 2 using artificial substrates (Quantitative methods) at sites > 20 sq. mi. and Qualitative sampling from the natural substrates in drainages < 20 sq. mi. Fish assemblages will be sampled at sites listed in Table 2 and, as a general rule, will be sampled employing 1x electrofishing pass for headwater drainages (< 20 sq. mi) and 2x passes at sites > 20 sq. mi. Physical habitat assessment scores using the Qualitative Habitat Evaluation Index (QHEI) will be calculated for all fish sampling locations.

Fish Tissue

Fish tissue samples will be collected from three selected Cross Creek locations in the vicinity of Satralloy as part of the Ohio Fish Tissue Consumption Monitoring

Program. Fillet samples of edible size sport fish will be tested for organochlorinated pesticides, PCBs, mercury, lead, cadmium, arsenic, and selenium. In addition, Hexavalent Chromium will also be analyzed since the runoff from the Satralloy property has included significant levels of the chemical. Results will be used in the Ohio Sport Fish Consumption Advisory Program.

Table 1. NPDES Dischargers in the CORT (Cross, Short, Wheeling Creeks) basin.

Permit #	Permit Name	Major Permit?	County	12-digit HUC	HUC12 Name
0ID00034*FD	Severstal Wheeling Inc Mingo Junction Plant *	Major	Jefferson	050301011005	Lower Cross Creek
0II00022*CD	Apex Limestone Plt	Minor	Jefferson	050301011001	Upper Cross Creek
0IL00093*HD	Hopedale Mining Preparation Plant	Significant Minor	Harrison	050301011001	Upper Cross Creek
0IN00106*CD	Crossridge Inc Landfill	Minor	Jefferson	050301011005	Lower Cross Creek
0IN00198*ED	Apex Environmental LLC Sanitary Landfill	Minor	Jefferson	050301011001	Upper Cross Creek
0PB00066*HD	Wintersville A WWTP	Minor	Jefferson	050301011005	Lower Cross Creek
0PD00010*ID	Mingo Junction STP	Minor	Jefferson	050301011005	Lower Cross Creek
0PH00000*HD	Jefferson Co - M WWTP	Minor	Jefferson	050301011005	Lower Cross Creek
0PW00011*GD	Granatir Apartments WWTP	Minor	Jefferson	050301011005	Lower Cross Creek
0IB00012*HD	Ohio Edison Co Toronto Plant	Significant Minor	Jefferson	050301011106	Hardin Run-Ohio River
0ID00033*GD	Severstal Wheeling Inc Steubenville Plant *	Major	Jefferson	050301011109	Wills Creek-Ohio River
0IE00009*CD	Barium & Chemicals Inc	Minor	Jefferson	050301011109	Wills Creek-Ohio River
0IE00010*HD	Titanium Metals Corp Toronto Plant	Major	Jefferson	050301011106	Hardin Run-Ohio River
0IN00113*ED	Richmond Mill Inc Fly Ash Disposal Site II	Minor	Jefferson	050301011106	Hardin Run-Ohio River
0IV00090*FD	Toronto WTP	Minor	Jefferson	050301011106	Hardin Run-Ohio River
0PA00064*GD	Empire WWTP	Minor	Jefferson	050301011106	Hardin Run-Ohio River
0PD00014*JD	Steubenville WWTP	Major	Jefferson	050301011109	Wills Creek-Ohio River
0PD00017*ID	Toronto WWTP	Minor	Jefferson	050301011106	Hardin Run-Ohio River
0PG00045*FD	Maplewood Subdiv	Minor	Jefferson	050301011109	Wills Creek-Ohio River
0PG00052*GD	Mellwood Acres STP	Minor	Jefferson	050301011107	Island Creek
0PG00053*ED	Ridgeland Subdiv WWTP	Minor	Jefferson	050301011106	Hardin Run-Ohio River
0PV00012*DD	Lake Lodge Mobile Home Village	Minor	Jefferson	050301011107	Island Creek
0PV00526*BD	Maragos Trailer Park	Minor	Jefferson	050301011107	Island Creek
0IK00011*BD	Harrison Ethanol LLC	Significant Minor	Harrison	050301060202	Middle Fork Short Creek
0IL00031*FD	Consolidation Coal Co Georgetown Prep Plt N	Significant Minor	Harrison	050301060202	Middle Fork Short Creek
0IL00036*ED	Consolidation Coal Co - Oak Park No 07 Mine	Significant Minor	Harrison	050301060202	Middle Fork Short Creek
0IL00092*HD	Hopedale Mining Cadiz Portal	Significant Minor	Harrison	050301060203	North Fork Short Creek
0IL00149*AD	DTE Dickerson LLC-Georgetown Prep Plant Area		Harrison	050301060201	South Fork Short Creek
0IN00253*BD	Harrison Ethanol LLC	Significant Minor	Harrison	050301060202	Middle Fork Short Creek

Permit #	Permit Name	Major Permit?	County	12-digit HUC	HUC12 Name
0PA00053*ED	Smithfield WWTP	Minor	Jefferson	050301060207	Dry Fork-Short Creek
0PB00009*DD	Cadiz WWTP	Minor	Harrison	050301060202	Middle Fork Short Creek
0PB00018*FD	Hopedale WWTP	Minor	Harrison	050301060204	Piney Fork
0PB00056*FD	Adena WWTP	Minor	Jefferson	050301060205	Perrin Run-Short Creek
0PQ00007*ED	Dillonvale-Mt Pleasant	Minor	Jefferson	050301060205	Perrin Run-Short Creek
0PT00023*CD	Buckeye Local Sch Dist	Minor	Jefferson	050301060207	Dry Fork-Short Creek
0IN00250*BD	Former Gould Manufacturing Facility *		Belmont	050301060304	Flat Run-Wheeling Creek
0PB00013*ED	Flushing WWTP	Minor	Belmont	050301060302	Headwaters Wheeling Creek
0PC00014*FD	St Clairsville WWTP *	Minor	Belmont	050301060303	Cox Run-Wheeling Creek
0PG00063*DD	Fox-Shannon WWTP	Minor	Belmont	050301060303	Cox Run-Wheeling Creek
0PH00012*GD	Pennwood Estates Subdiv	Minor	Belmont	050301060304	Flat Run-Wheeling Creek
0IB00009*QD	Cardinal Operating Co 1 & 2 *	Major	Jefferson	050301061202	Salt Run-Ohio River
0IL00143*AD	Bellaire Harbor Service LLC	Significant Minor	Belmont	050301061205	Boggs Run-Ohio River
0IL00146*AD	Riddles Run Refuse Disposl/Coal Processing Plant	Significant Minor	Jefferson	050301061202	Salt Run-Ohio River
0PB00052*FD	Yorkville STP *	Minor	Belmont	050301061204	Glenns Run-Ohio River

Table 2. Sampling locations, arranged by 12-digit HUC, in the CORT (Cross, Short, and Wheeling Creeks) watershed including sampling parameters and purpose associated with each site.

Site #	Basin #	Stream #	HUC 12# - HUC 12 Name Stream and Location	RM	STORET	DA	Latitude	Longitude	Sampling	Purpose	map #	Topo Name	Aquatic Life Use*
			HUC 050301011001 - Upper Cross Creek										
1	06	200	Cross Ck @ TR 309 ust N. Br. Cross Ck	24.87	**C04S06**	11.80	40.360708	-80.870778	F1x, Bql, C, Bac-T	Historical	409	Smithfield	WWH +
2	06	208	North Branch Cross Ck Adj TR 309	0.10	**C04S20**	11.30	40.360840	-80.870083	F1x, Bql, C	Historical	409	Smithfield	WWH +
			HUC 050301011002 - Salem Creek										
3	06	205	Salem Ck @ TR 136	4.57	**300979**	8.01	40.396047	-80.847856	F1x, Bql,C,	Ambient	374	Richmond	WWH +
4	06	205	Salem Ck @ Private Drive nr. mouth	0.10	**203435**	15.30	40.370165	-80.798904	F1x, Bql, C, Bac-T	Historical	409	Smithfield	WWH +
5	06	207	Leas Branch @ T-136	0.15	**301046**	2.72	40.395375	-80.839705	F1x, Bql	Verify Use Desig.	374	Richmond	*CWH
6	06	206	Grassy Run @ T-205, ust. Seminary pond	0.68	**301047**	4.16	40.391530	-80.815333	F1x, Bql	Verify Use Desig.	374	Richmond	*CWH
			HUC 050301011003 - Middle Cross Creek										
7	06	200	Cross Ck @ CR 39 (Unionport Rd)	22.90	**300813**	28.30	40.357610	-80.848053	F2x, BQnt, C, Bac-T, D, S.	Sentinel Site	409	Smithfield	WWH +
			HUC 050301011004 - McIntyre Creek										
8	06	210	McIntyre Ck @ nr. Weems @ RR bridge	7.59	**C04S14**	13.60	40.288300	-80.761700	F1x, Bql, C	Ambient	409	Smithfield	WWH +
9	06	210	McIntyre Ck @ TR 184	0.50	**C04S52**	24.20	40.300512	-80.684385	F2x, BQnt, C, Bac-T, D, S.	Sentinel Site	410	Steub. W	WWH +
10	06	215	Little McIntyre Ck. @ mouth nr. T-177	0.10	**301048**	3.16	40.285693	-80.762513	F1x, Bql	Verify Use Desig.	409	Smithfield	*CWH
11	06	214	Slab Run ust. RR trestle	0.15	**301049**	1.16	40.288407	-80.743964	Ftbd, Bql	Verify Use Desig.	409	Smithfield	*CWH
12	06	211	Long Run @ CR 74 (Mingo Junc.-Goulds Rd)	0.03	**300980**	3.04	40.304668	-80.684445	F1x, Bql, C	Verify Use Desig.	410	Steub. W	*CWH
			HUC 050301011005 – Lower Cross Creek										
13	06	200	Cross Ck @ Broadacre (SR 152)	16.20	**300668**	53.50	40.365583	-80.784457	F2x, BQnt, C, Bac-T, D, S.	Sentinel Site, Hellbenders	409	Smithfield	WWH+
14	06	200	Cross Ck @ CR 26 (Bloomingdale - Fernwood Rd)	9.72	**C04S04**	78.00	40.334206	-80.716479	F2x, BQnt, C	Historical, ust. Barbers Hollow	410	Steub. W	WWH+
15	06	200	Cross Ck @ TR 166 ford Dst Landfills	6.95	**301050**	88.60	40.321672	-80.676203	F2x, BQnt, C, D, S	Dst. Landfills	410	Steub. W	WWH+
16	06	200	Cross Ck @ Satralloy Pipe 001	4.95	**301051**	117.00	40.308020	-80.669068	C	Mix zone	410	Steub. W	WWH+
17	06	200	Cross Ck @ Satralloy Pipe 002	4.75	**301051**	117.00	40.310480	-80.667902	C	Mix zone	410	Steub. W	WWH+
18	06	200	Cross Ck @ CR 74 (Mingo Junction - Goulds Rd)	4.15	**C04S01**	117.00	40.313100	-80.660300	F2x, BQnt, C, Bac-T, D, S	Sent., Hist. Site Dst. Satralloy	410	Steub. W	WWH+
19	06	200	Cross Ck @ South Commercial Ave.	0.78	**301052**	128.00	40.316040	-80.613210	F2x, BQnt, C, D, S	Lotic, nr. mouth	411	Steub. E	WWH+
20	06	204	Clay Lick Ck @ TR 166 (Bio. Dst. SR 152)	0.03	**300989**	6.61	40.364213	-80.774670	F1x, Bql, C	Verify Use Desig.	409	Smithfield	*CWH
21	06	203	Cedar Lick Ck @ TR 166	0.05	**C04S19**	6.60	40.368286	-80.756475	F1x, BQnt, C	Ref. Site	409	Smithfield	WWH+

Site #	Basin #	Stream #	HUC 12# - HUC 12 Name Stream and Location	RM	STORET	DA	Latitude	Longitude	Sampling	Purpose	map #	Topo Name	Aquatic Life Use*
22	06	202	Cedar Lick Run @ CR 22A	0.10	**C04S51**	3.50	40.363235	-80.745144	F1x, Bql, C	Verify Use Desig.	410	Steub. W	*CWH
23	06	209	Barbers Hollow @ TR 166 (Wintersville Rd) dst. Wintersville E plant	0.06	**300991**	3.20	40.334971	-80.713658	F1x, Bql, C	Dst. WWTP, Historical	410	Steub. W	WWH+
24	06	201	Dry Fork ust. AMD trib.	0.56	**C04S08**	4.80	40.323127	-80.656163	F1x, Bql, C	Ust. Acid trib.	410	Steub. W	WWH+
25	06	201	Dry Fork @ Gould (Driveway Bridge)	0.28	**C04S07**	6.60	40.319761	-80.654181	F1x, Bql, C, D	Dst. Acid trib.	410	Steub. W	LRW (AMD)
			HUC 050301011106 – Hardin Run-Ohio River										
26	06	074	Croxton Run @ CR 47 (JF K Highway)	0.74	**300992**	7.81	40.481347	-80.613836	F1x, Bql, C, Bac-T	Ambient	376	Weirton	WWH*
			HUC 050301011107 – Island Creek										
27	06	070	Island Ck @ TR 373	6.28	**300993**	7.31	40.437003	-80.697934	F1x, Bql, C	Ambient	375	Knoxville	CWH+
28	06	070	Island Ck @ CR 56 nr. SR 213	3.43	**C04S42**	19.60	40.442673	-80.662272	F1x, Bql, C	Historical	375	Knoxville	CWH+
29	06	070	Island Ck @ Costonia-Mt Tabor Rd (CR 56)	0.36	**300814**	23.70	40.431548	-80.619290	F2x, BQnt, C, Bac-T, D, S	Sentinel Site	376	Weirton	CWH+
			HUC 050301011109 – Wills Creek-Ohio River										
30	06	066	Wills Ck adj CR 43 Ust North Fork Wills Ck	2.40	**C04W36**	5.80	40.386000	-80.665100	F1x, Bql, C	Historical	375	Knoxville	WWH+ (poss. CWH)
31	06	066	Wills Ck adj CR 43 Ust US 22 nr mouth	0.70	**C04K65**	13.90	40.382200	-80.643300	F1x, Bql, C, Bac-T	Historical	375	Knoxville	WWH+ (poss. CWH)
32	06	069	North Fork Wills Ck @ 7 Creeks Rd.	0.17	**C04S23**	5.70	40.389270	-80.660052	F1x, Bql, C	Historical	375	Knoxville	CWH+
			HUC 050301060201 – South Fork Short Creek										
33	06	618	South Fk Short Ck @ TR 83 (Greaves Rd)	1.13	**301053**	14.01	40.203612	-80.901059	F1x, Bql, C, Bac-T	Ambient	443	Harrisville	WWH*
			HUC 050301060202 - Middle Fork Short Creek										
34	06	617	Liming Ck @ TR 76 (Jackson Rd)	0.15	**301063**	4.71	40.245521	-80.968926	F1x, Bql, C, D, S	Ust. Sally Buff.	443	Harrisville	MWH+ (mine) ?
35	06	619	Sally Buffalo Ck just ust Cadiz WWTP	0.17	**301058**	9.92	40.242798	-80.971755	F1x, Bql, C, D	Ust. WWTP, Redesignate	443	Harrisville	*L (TDS exempt)
36	6	619	Cadiz WWTP	0.10	**C03S10**	9.92	40.243100	-80.970000	E	Effluent	443	Harrisville	
37	06	617	Middle Fork Short Ck @ CR 15 (Foxs Bottom Rd; 2nd Crossing)	5.35	**C03S09**	15.80	40.239400	-80.955800	F1x, Bql, C, D, S	Dst. Cadiz WWTP	443	Harrisville	MWH+ (mine)
38	06	617	Middle Fork Short Ck @ CR 41 (Georgetown - Adena Rd)	0.23	**C03S08**	24.00	40.213038	-80.891039	F2x, BQnt, C, Bac-T	Ambient	443	Harrisville	MWH+ (mine)
			HUC 050301060203 - North Fork Short Creek										
39	06	620	North Fork Short Ck @ CR 12 (Unionvale Rd) Dst Harmon Ck	6.21	**301054**	11.00	40.272759	-80.926421	F1x, Bql, C	Ambient	408	Cadiz	WWH*
40	06	620	North Fork Short Ck @ Nagy Ln from CR 10	0.09	**301055**	18.01	40.220743	-80.872937	F1x, Bql, C, Bac-T,D,S	Ambient	444	Dillonvale	WWH*
			HUC 050301060204 - Piney Fork										
41	06	610	Piney Fork @ TR 192 Ust L. Piney Fork	10.51	**301056**	7.64	40.279113	-80.853833	F1x, Bql, C	Redesignate	409	Smithfield	*L (TDS exempt)

Site #	Basin #	Stream #	HUC 12# - HUC 12 Name Stream and Location	RM	STORET	DA	Latitude	Longitude	Sampling	Purpose	map #	Topo Name	Aquatic Life Use*
42	06	610	Piney Fork @ SR 150	0.35	**C03K02**	22.40	40.205000	-80.766100	F2x, BQnt, C, Bac-T, D, S	Redesignate	444	Dillonvale	*L (TDS exempt)
			HUC 050301060205 - Perrin Run-Short Creek										
43	06	600	Short Ck @ CR 10 (Mill St) Dst North Fork	19.37	**C03S07**	64.00	40.219200	-80.872800	C, Bac-T, D, S	Sentinel Site, Redesignate	444	Dillonvale	*L (TDS exempt)
43a	06	600	Short Ck @ ust Adena WWTP nr. RR Trestle	18.90	**301241**	64.00	40.215276	-80.866657	F2x, BQnt	Dst. Lift Station Redesignate	444	Dillonvale	*L (TDS exempt)
44	06	600	Short Ck @ CR 7 (Dillonvale - Long Run Rd) ust Long Run	12.68	**301059**	76.20	40.199174	-80.810559	F2x, BQnt, C, D, S	Redesignate	444	Dillonvale	*L (TDS exempt)
45	06	600	Short Ck dst Dillonvale WWTP ust Piney Fork	8.84	**C03W07**	87.00	40.201300	-80.767300	F2x, BQnt, C, Bac-T, D, S	Redesignate	444	Dillonvale	*L (TDS exempt)
46	06	607	Long Run @ CR 7 (Dillonvale-Long Run Rd)	0.26	**301060**	6.50	40.197326	-80.814539	F1x, Bql, C	Ambient	444	Dillonvale	WWH*
			HUC 050301060206 - Little Short Creek										
47	06	602	Little Short Ck @ TR 472 (SCk Glenn Robbins Rd) ust Parkers Run	4.99	**301061**	11.00	40.151409	-80.767506	F1x, Bql, C	Redesignate	444	Dillonvale	*L (TDS exempt)
48	06	602	Little Short Ck @ TR 113	0.08	300815	17.60	40.184504	-80.708465	F1x, Bql, C, Bac-T, D, S	Sentinel Site	445	Tiltonsville	*L (TDS exempt)
49	06	604	Coal Run @ mouth (mine road off SR 647)	0.15	301064	2.00	40.150200	-80.795360	F1x, Bql	Redesignate	444	Dillonvale	*L (TDS exempt)
			HUC 050301060207 - Dry Fork-Short Creek										
50	06	600	Short Ck @ SR 150 nr. USGS Gage	4.96	**609240**	123.00	40.193300	-80.734400	F2x, BQnt, C, Bac-T, D, S	Sentinel Site, Redesignate	445	Tiltonsville	*L (TDS exempt)
51	06	606	Dry Fork @ SR 150	0.15	**C03W17**	8.50	40.210953	-80.758329	F1x, Bql, C,	Ambient	444	Dillonvale	WWH*
			HUC 050301060301 - Crabapple Creek										
52	06	815	Crabapple Ck @ CR 66 (Uniontown - New Athens Rd)	2.88	**C03S14**	10.20	40.137746	-80.990941	F1x, Bql, C	Ambient	443	Harrisville	WWH +
53	06	815	Crabapple Ck @ CR 10 (Crabapple Rd)	0.16	**C03L05**	19.60	40.116900	-80.955600	F2x, BQnt, C, Bac-T, D, S	Sentinel Site	477	St. Clairs.	MWH + (mine)
54	06	816	Campbell Run @ mouth from abandoned TR 414	0.03	**301065**	7.30	40.126406	-80.962699	F1x, Bql, C	Ambient, poss. AMD	443	Harrisville	WWH*
			HUC 050301060302 - Headwaters Wheeling Ck										
55	06	800	Wheeling Ck @ CR 72 (Mt Hope Rd)	27.83	**203460**	4.40	40.109889	-81.025974	F1x, Bql, C	Redesignate	476	Bethesda	*L (TDS exempt)
56	06	800	Wheeling Creek CR 78 (National Oco Rd)	25.97	**C03S16**	13.40	40.106601	-81.000277	F1x, Bql, C	Redesignate	476	Bethesda	*L (TDS exempt)
57	06	800	Wheeling Ck @ TR 337 (Lee Rd) ust Crabapple Ck	22.73	**300817**	24.20	40.109619	-80.969829	F2x, BQnt, C, Bac-T, D, S	Sentinel Site Redesignate	477	St. Clairs.	*L (TDS exempt)
			HUC 050301060303 - Cox Run-Wheeling Creek										
58	06	800	Wheeling Creek @ CR 10 (Fairport - Maynard Rd)	17.34	**301066**	59.60	40.127307	-80.906262	F2x, BQnt, C, D, S	Redesignate	443	Harrisville	*L (TDS exempt)

Site #	Basin #	Stream #	HUC 12# - HUC 12 Name Stream and Location	RM	STORET	DA	Latitude	Longitude	Sampling	Purpose	map #	Topo Name	Aquatic Life Use*
59	06	800	Wheeling Ck @ Crescent-Barton Rd (Ust Town Run)	10.99	**C03W15**	80.00	40.114000	-80.860000	F2x, BQnt, C, D, S Bac-T	Bacteria	478	Lansing	*L (TDS exempt)
60	06	812	Pogue Run @ CR 10 (Fairport-Maynard Rd)	0.11	**301067**	5.30	40.119658	-80.916839	F1x, Bql, C	Dst. Fox Shannon WWTP	477	St. Clairsville	WWH +
61	06	810	Cox Run @ TR 432 (Stonehouse - Purseglove Rd)	0.03	**301068**	7.30	40.121064	-80.885988	F1x, Bql, C	Ambient	477	St. Clairsville	WWH +
62	06	807	Fall Run adj CR 10/CR5 near Crescent	0.03	C03L10	3.83	40.121280	-80.862460	F1x, Bql, C	AMD	478	Lansing	WWH*
63	06	806	Town Run @ TR 434 (Hells Kitchen Rd)	0.28	**C03S01**	2.40	40.103898	-80.855285	F1x, Bql, C	Dst St Clairs. WWTP	478	Lansing	WWH+
			HUC 050301060304 - Flat Run - Wheeling Creek										
64	06	800	Wheeling Ck @ CR 10 (Barton -Blaine Rd)	9.40	**203459**	86.00	40.096802	-80.838542	F2x, BQnt, C, D, S	Redesignate	478	Lansing	*L (TDS exempt)
65	06	800	Wheeling Ck @ Blain (Pease Rd)	5.05	**C03S18**	96.00	40.066900	-80.808600	F2x, BQnt, C, Bac-T, D, S	Sentinel Site; Redesignate	478	Lansing	*L (TDS exempt)
66	06	800	Wheeling Ck @ Cr 24 (Boydsville Rd)	1.64	**609230**	103.00	40.067097	-80.767283	F2x, BQnt, C	Redesignate	478	Lansing	*L (TDS exempt)
67	06	805	Steep Run dst CR 10 at RR bridge	0.03	301081	2.27	40.107090	-80.841160	F1x, Bql, C	AMD	478	Lansing	WWH*
			HUC 050301061201 - Rush Run										
68	06	067	Rush Run adj. CR 17 (Rush Run Road)	2.80	**301069**	8.45	40.233575	-80.703391	F1x, Bql, C	Ambient	445	Tiltonsville	WWH*
69	06	067	Rush Run Adj CR 17 (Rush Run Road)	0.65	**301070**	12.01	40.223611	-80.672462	F1x, Bql, C, Bac-T	Ambient	445	Tiltonsville	WWH*
			HUC 050301061202 - Salt Run-Ohio River										
70	06	062	Salt Run Adj TR 157 (church bridge xing)	0.60	**301072**	4.02	40.249041	-80.663961	F1x, Bql, C, Bac-T	Amer. Energy runoff	445	Tiltonsville	WWH*
			HUC 050301061204 - Glenns Run-Ohio River										
71	06	053	Glenns Run at CR 4 ust. Patton Run	1.90	301080	6.17	40.108560	-80.745610	F1x, Bql, C	Ust. AMD	479	Wheeling	WWH*
72	06	053	Glenns Run @ CR 4 (Glenns Run Rd)	0.1	**300816**	10.70	40.117515	-80.710518	F1x, Bql, C, Bac-T, D, S	Sentinel Site; Dst. AMD	479	Wheeling	WWH*
73	06	058	Deep Run adj Deep Run Rd ust AMD	2.40	301082	2.48	40.145820	-80.734870	F1x, Bql, C	Ust. AMD	479	Tiltonsville	WWH*
74	06	058	Deep Run at Deep Run Rd at RR Tressel	0.25	301083	4.11	40.150130	-80.710820	F1x, Bql, C	Dst. AMD	479	Tiltonsville	WWH*
			Sample if resources available.										
75	06	213	Slabcamp Creek @ mouth (no access)	0.10		2.58	40.292919	-80.731779	F1x, Bql.,	050301011004	409	409	*CWH
76	06	212	Polecat Hollow @ mouth (no access)	0.10		0.64	40.294660	-80.730169	F-tbd, Bql.,	050301011004	409	409	*CWH

F1x = Fish (1 sampling pass) **F2x** = Fish (2 sampling passes), **F-tbd** = to be determined (based on field obs.)
Bql = Benthic Macroinvertebrates [Qualitative (Dipnet/Handpick) Method] **BQnt** = Benthic Macroinvertebrates [Quantitative (Artificial substrate) Method],
C = Water Column Chemistry **Bac-T** = Bacteriological Sampling , **D** = Datasonde© Continuous Monitor, **S** = Sediment Chemistry

Table 3. Ohio EPA test methods for the 2010 CORT (Cross, Short, Wheeling Creeks) watershed study area.

Parameters	Water column field test method	Water column lab test method	Sediment lab test method
Percent Solids			SM 2540G
Conductivity	YSI 556 meter	USEPA 120.1	
Particle Size			OEPA 160.1
pH	YSI 556 meter		
Solids, Dissolved (TDS)		USEPA 160.1	
Solids, Suspended (TSS)		USEPA 160.2	
Total Organic Carbon (TOC)			OEPA 335.2
Acidity, Total CaCO3		USEPA 305.1	
Alkalinity, Total CaCO3		USEPA 310.1	
Chloride, Cl		USEPA 325.1	
COD		USEPA 410.4	
Nitrite		USEPA 354.1	
Ammonia		USEPA 350.1	SM 4500 -NH3 B&E
Nitrate+Nitrite		USEPA 353.1	
Phosphorus, Dissolved		USEPA 365.4	
Sulfate		USEPA 375.4	
TKN (Total Kjeldahl Nitrogen)		USEPA 351.2	
Phosphorus, Total		USEPA 365.4	USEPA 365.4
E.coli		USEPA 1103.1/ 640.1	
ICP 1 (Al,Ba,Ca,Fe, Mg, Mn, Na, Ni, K, Sr, Zn, Hardness)		USEPA 200.7	
ICP 3 (Al, Ba, Ca, Fe, Mg, Mn, Na, K, Sr, Zn)			USEPA 200.7
ICPMS 1 (As, Cd, Cr, Cu, Ni, Pb,Se)		USEPA 200.9,	SM 3113B
ICPMS 2 (As, Cd, Cr, Cu, Ni, Pb, Se)			SM 3113B
Mercury, Total		USEPA 245.1,7470A	USEPA 7471A
Chlorophyll a		USEPA 445	
Dissolved Oxygen	YSI 556 meter		
Temperature	YSI 556 meter		
BNA Organics (SVOCs)		USEPA 625	USEPA 8270C

Contacts:

Study Planning Team: Assigned DSW Staff

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Jack Freda (Macroinvertebrates)	614-836-8783
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Randy Spencer (Water Chemistry/NPS)	740-380-5240
Aaron Pennington (NPDES)	740-380-5272
Aaron Wolfe (Stormwater)	740-380-5277
Tim Campbell (Enforcement)	740-380-5426
Dale White (Modeling)	614-644-2884
Greg Sablak (TMDL Coordinator)	614-644-4132
Dan Gill (CO NPDES)	614-644-2118
Chris Skalski (Standards)	614-644-2144

ODNR Wildlife Officers

Belmont County - Brian Baker	(740) 589-9981
Jefferson County - Timothy Stevens	(330) 245-3050
Harrison County - Nick Turner	(330) 245-3049

ODNR Reclamation

Barb Flowers	(740) 592-3748

Police Departments

Steubenville PD
123 South Third St. Steubenville, OH 43952 (740) 282-5353

State Highway Patrol
Jefferson County and Harrison County
Steubenville Patrol Post
1377 Cadiz Road Wintersville, OH 43953
phone: (740) 264-1641 fax: (740) 264-0094

Belmont County
St. Clairsville Patrol Post
51400 National Road St. Clairsville, OH 43950
phone: (740) 695-0915 fax: (740) 695-5240

County Sheriff Offices

Belmont County – Fred A. Thompson
68137 Hammond Road, St Clairsville, OH 43950-8755 (740) 695-7933

Jefferson County - Sheriff Abdalla
16001 St. Rt. 7, Steubenville, OH 43952 (740) 283-8600

Steubenville PD
123 South Third St. Steubenville, OH 43952 (740) 282-5353

Harrison County – Joe Myers
114 Court Street, Cadiz, OH 43907-1116 (740) 942-2197

Hospitals

Jefferson County
Trinity Medical Center East Switchboard 740-283-7000 (see map)
380 Summit Avenue
Steubenville, Ohio 43952

Trinity Medical Center West Switchboard 740-264-8000 (see map)
4000 Johnson Road
Steubenville, Ohio 43952

Belmont County
Belmont Community Hospital
4697 Harrison St. Bellaire, Ohio 43906 (740) 671-1200 (see map)

East Ohio Regional Hospital
90 N 4th St, Martins Ferry, OH 43935 (740) 633-1100 (see map)

304 W Main St, St Clairsville, OH (740) 695-1869 (see map)

106 Plaza Dr, St Clairsville, OH (740) 695-2364 (see map)

Harrison County
Harrison Community Hospital (740) 942-4631
951 East Market Street
Cadiz, OH 43907

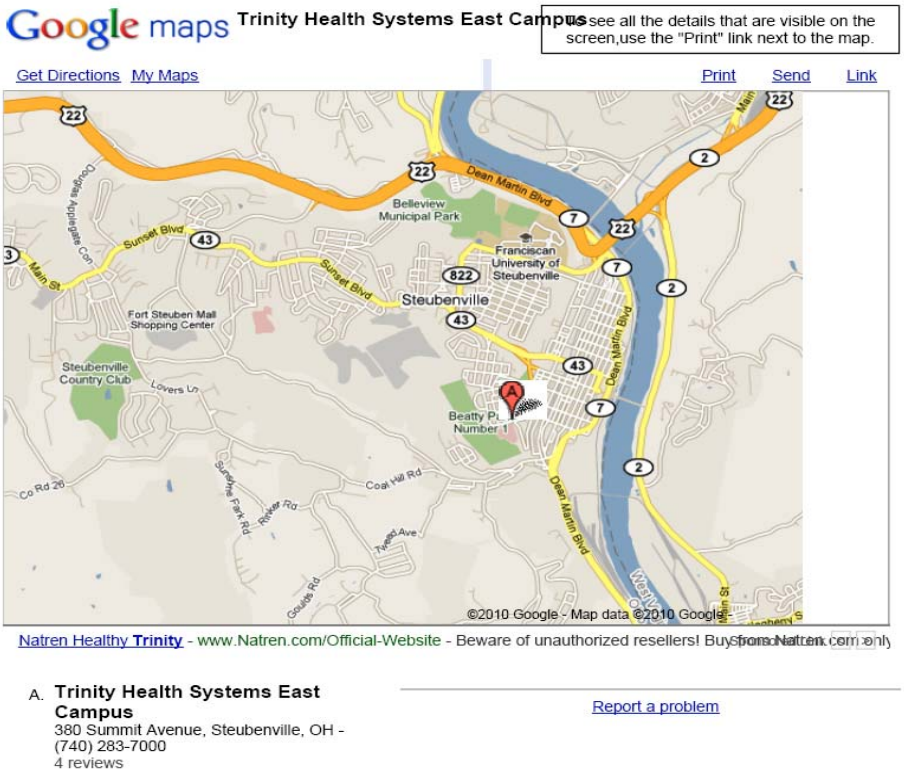
Watershed Contacts

Jefferson County SWCD (740) 264-9790
131 Main Street, Lower Level
Wintersville, OH 43953

Belmont County SWCD (740) 526.0027
101 N Market St Suite D
St Clairsville, Ohio 43950

Harrison County SWCD (740) 942-8837
538 North Main Street
Cadiz, OH 43907

Please contact Jack Freda for any updates to this study plan



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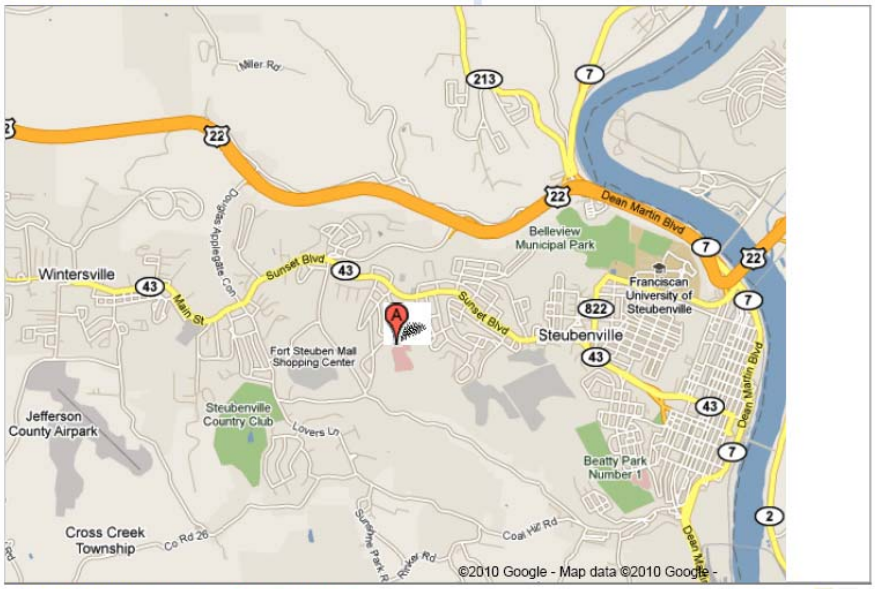

Trinity Medical - indeed.com/Trinity-Medical - Find all Trinity Medical postings here, the most complete job site online

A. **Trinity Medical Center West**: Jesick Gretchen A MD
4000 Johnson Road, Steubenville, OH -
(740) 264-8000

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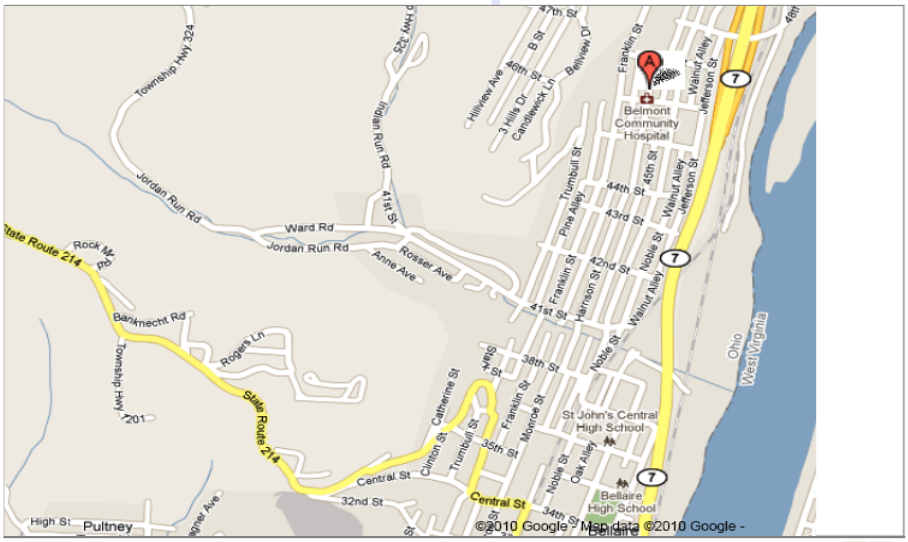

Dr. Frederick Brautigan - www.HealthGrades.com - MD Report - Check for disciplinary action, certifications, background

A. **Belmont** Community **Hospital**: **Brautigan Frederick** B **MD**
4697 Harrison Street, Bellaire, OH -
(740) 671-1200
1 review

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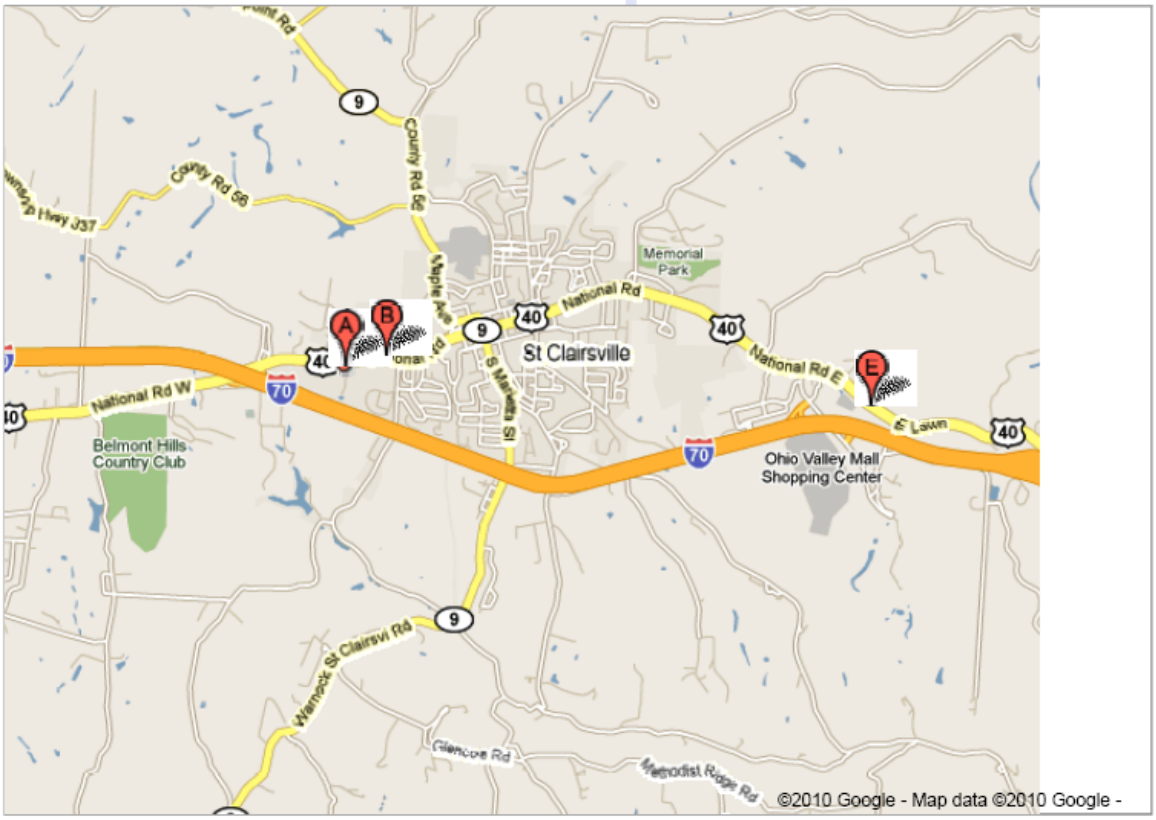

A. East Ohio **Regional Hospital**
106 Plaza Drive, St Clairsville, OH - (740) 695-2364

B. East Ohio **Regional Hospital**
304 West Main Street, St Clairsville, OH - 695-1869

C. East Ohio **Regional Hospital**: Sukys Nancy A MD
Ste D, 107 Plaza Drive, Saint Clairsville, OH - (740) 695-2090

D. East Ohio **Regional Hospital**: Glorioso Joseph J DO
106 Plaza Drive, Saint Clairsville, OH - (740) 699-2730
2 reviews

E. East Ohio **Regional Hospital**: Chia Imelda MD
51342 National Road East, St Clairsville, OH - (740) 695-6500
1 review

F. East Ohio **Regional Hospital**
Martins Ferry, Ohio - (740) 633-1100
5 reviews

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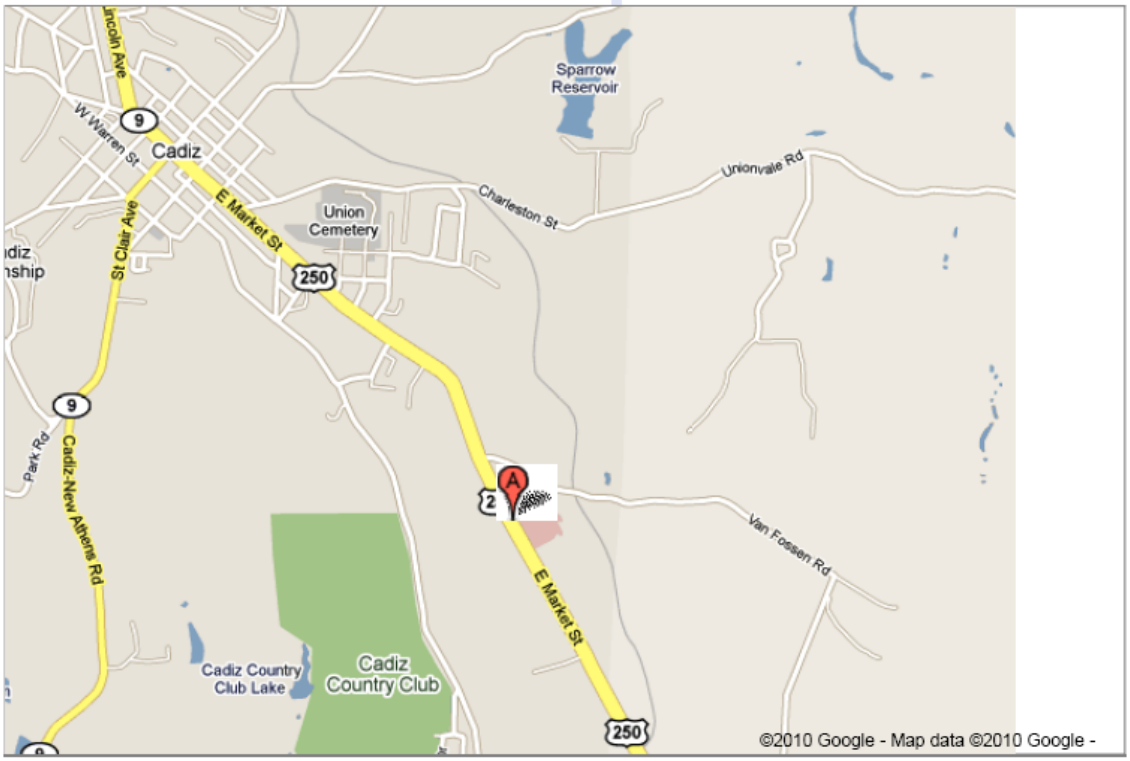

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2 reviews

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