

WEEMS CREEK TRIBUTARIES STREAM SURVEY

REPORT OF FINDINGS

JUNE 30, 1994

The information contained in this report was compiled and written by Maryland Save Our Streams' staff and volunteers. Additional support and funding for this project was provided by Anne Arundel County.

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PROGRESS REPORT

The following outline lists known follow-up and/or restoration activities that have occurred since the Weems Creek tributaries survey on September 25, 1993.

SURVEY SITE 2: (Hock Property Drainage) The Anne Arundel County Office of Planning and Code Enforcement conducted a review of PO #11 in late February/early March. No sediment or enforceable sediment control violations were observed at the time of the survey.

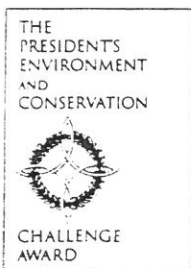
SURVEY SITE 4: (Cowhide Branch--Lower Portion) On January 25, 1994, the Recreational Waters Section of the Anne Arundel County Health Department inspected a reported pipe outfall adjacent to the Harbour Gates project (listed in the survey as PO #3). No unauthorized discharges were found. It was further determined that the series of PVC pipes were abandoned well hoses that are not attached to any fixture or utility.

On November 16th, 1993, the Sanitary Engineering Section of the County Health Department inspected and approved the permit for the Harbour Gates Community swimming pool.

SURVEY SITE 5: (Cowhide Branch--Upper Portion) Since the stream survey, Anne Arundel County has completed work on stormwater management pond reconstruction behind the Annapolis Mall. Work has also been completed on stream channel restoration for 2,100 feet of Cowhide Branch downstream from the management pond. Future activities include stream bank replanting, and wetlands planting in the stormwater management pond.

The County Office of Planning and Code Enforcement conducted a review of PO #4 in late February/early March. No discharge or evidence of odor or soapy discharge were found at the time of this review.

(over)



1992

SURVEY SITE 6: (Cowhide Branch Tributary) On March 5, 1994, employees from Nordstroms Department store, working in collaboration with Tree-mendous Maryland and Save Our Streams, conduct a clean up of a large trash site behind the Annapolis Plaza. This site (listed in the survey as TD #3) was identified during the stream survey. Fifty volunteers collected approximately 120 bags of trash and significantly cleaned up the site.

SURVEY SITE 8: (Tributary of West Street Drainage) The Anne Arundel County Office of Planning and Code Enforcement investigated PO #1 and PO #2 in late February/early March. No evidence of a problem was found at the time of the inspection. The Office reported that the Hudson Street concrete plant has an erosion and sediment control plan with a recycle system. When the system is not working properly, a gray/white discharge is evident. This system is inspected on a quarterly basis at least. While no problems (other than the survey report) have been reported recently, the office did indicate that the company has been cited in the past, due to citizen complaints.

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WEEMS CREEK TRIBUTARIES STREAM SURVEY

REPORT OF FINDINGS

Introduction

On Saturday, September 25, 1993, twenty-five Maryland Save Our Streams (SOS) volunteers conducted a stream survey along the major tributaries and drainage areas which enter into Weems Creek.

SOS was contracted by Anne Arundel County to conduct this project as part of a comprehensive effort to examine the watershed and the environmental stresses it faces. Information collected during the survey would be used to assist the County and watershed residents in making future decisions on retrofitting and other improvement projects.

Weems Creek, one of several major water bodies in the Annapolis area, has been the focus of a great deal of community and government study, attention, and concern during the last several years. The Weems Creek watershed drains approximately 1,300 acres of land. It is bordered primarily by Route 50/301 and Bestgate Road to the north, the Annapolis Mall to the west, and West Street, Farragut Road and Melvin Avenue to the south. The watershed primarily contains a variety of residential and commercial development. Some degree of forested buffer remains along most major portions of the tributary system. The largest remaining natural area in the watershed is the Hock Property, located on the northern shoreline of the main stem of Weems Creek, in the headwaters region.

The planning and organizing of this project, and the writing and printing of this report, was funded through a grant provided by Anne Arundel County. Significant volunteer support in the project's planning was also provided by the Weems Creek Conservancy, an umbrella organization which represents various community associations within the Weems Creek watershed.

On the morning of September 25, 1993, volunteers met at the Tawes State Office Building in Annapolis for a training session. The volunteers were divided into nine survey teams and given one (or in some instances, two) sections of stream to survey. Maryland Save Our Streams provided each team with a work sheet that allowed them to identify and map potential pollution sources, and report other pertinent information. Specifically, the volunteers were asked to identify the following: exposed sections of sewer line, sewage overflow points, fish migration barriers, pipe outfalls, unusual stream conditions, channelized stream sections, in-stream construction activity, unshaded stream sections, evidence of erosion, trash dumping areas, and sediment loading.

A majority of the field work was completed on September 25. The day of the survey was overcast. Light rain began falling during the early afternoon. The rain became steadier and heavier as the afternoon progressed. Most of the survey work was completed before any measurable accumulation had occurred.

Field work on Survey Site 11 was conducted on September 26. Weather conditions at the time of the survey were reported to be sunny.

SOS staff, with assistance from a University of Maryland--Baltimore County intern, conducted quality control follow up work along two survey sites. A review of Survey Site 6 was conducted on October 29, 1993. A review of Survey Site 8 was conducted on December 3, 1993. On both days, weather conditions were partly cloudy and dry.

The roughly four-and-one-half miles of stream was divided into eleven survey sections. Survey results were returned to Save Our Streams' staff, which compiled the information for each survey site into a draft summary. All participants were mailed the draft summary of their survey site, for review and comment.

A draft of the entire final report was sent to Anne Arundel County officials, and representatives of the Weems Creek Conservancy for final review and comment.

About the Final Report

This report represents a summary of the volunteers' findings. It contains the results from all eleven survey sites, as well as a map to help the reader visualize the general location of the potential pollution problems that were observed.

The stream survey report highlights most, but not necessarily all, of the observations made by the volunteers. Original activity packets, however, are on file at the SOS offices. Although this survey did not include visual monitoring along the navigable portions of Weems Creek, a similar activity along that portion of the watershed was conducted during the "Great Severn River Stream Survey", on May 11, 1991. Copies of this report, and the original activity packets, are on file at the SOS offices. If you have any questions, please contact Maryland Save Our Streams at 969-0085 or 800-448-5826.

In this report, each survey site includes the following information:

- a) a description of the site's beginning and end point;
- b) a listing of the number of potential pollution problems that were identified by the volunteers;
- c) a summary highlighting the main findings of the volunteers;
- d) a map which outlines the survey section boundaries and approximate location of each finding mentioned in the summary.

It is very important to remember the following as you read this report:

- a) Volunteers were asked to identify and map potential sources of pollution as well as actual sources. In some cases (for example, the identification and listing of exposed sections of sewer line or pipe outfalls) volunteers were

asked to identify items that may not be posing a problem at the time of the survey, but which are representative of a possible threat to the health of a waterway.

- b) The findings of the September 25 stream survey represent a "snapshot" of the Weems Creek Watershed. Some of the items that were reported (for example, an unusual stream condition) may not exist during a follow-up investigation. At the same time, many of the findings (for example, a channelized section of stream) are constant and long term.

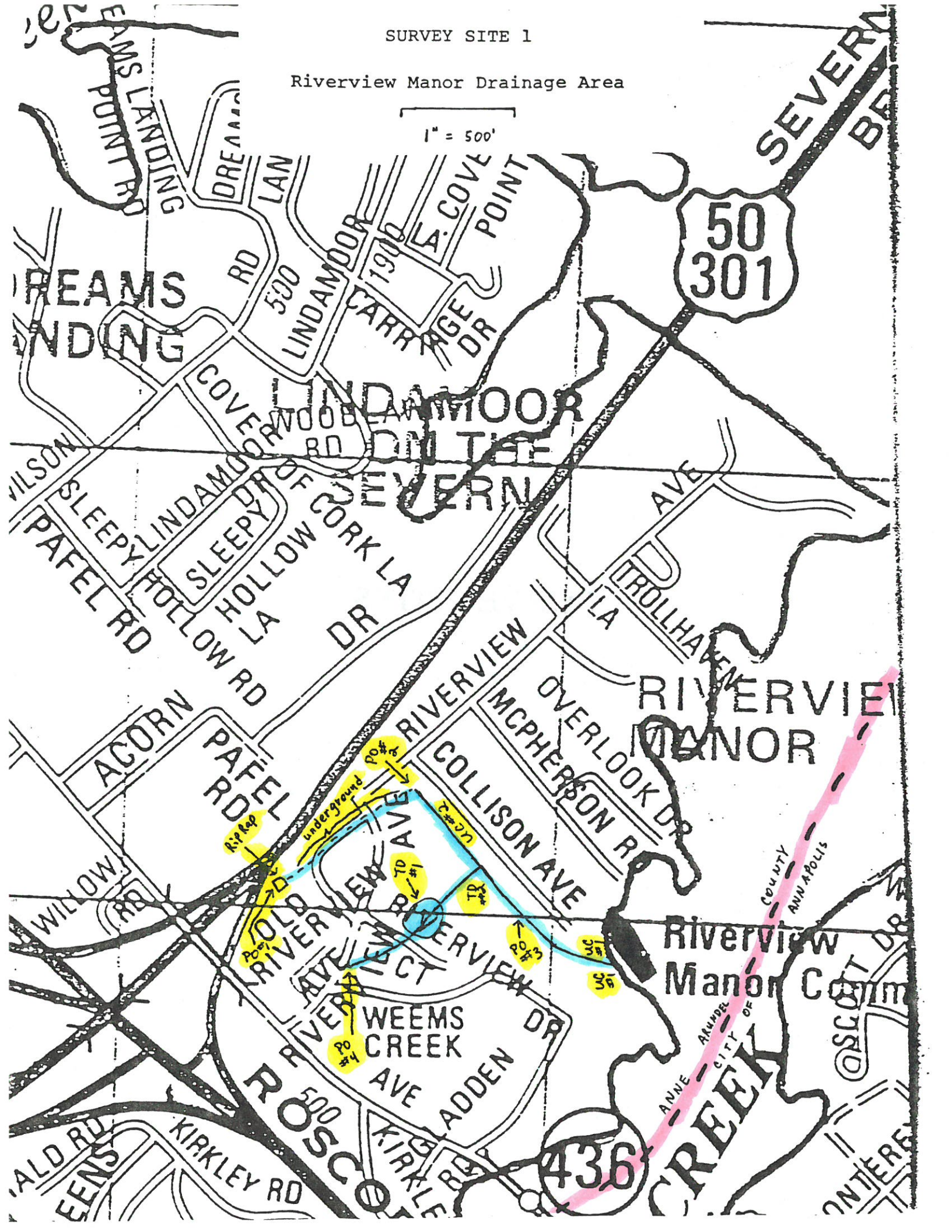
Following the individual site summaries, two sections close out this report. The first section highlights overall survey findings, based on each of the eleven potential pollution problems which were examined. Perhaps the most important section is an outline of recommendations for follow-up activities by government, citizens, and/or business.

SURVEY SITES

SURVEY SITE 1

Riverview Manor Drainage Area

1" = 500'



SURVEY SITE 1

LOCATION: RIVERVIEW MANOR DRAINAGE AREA

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
PIPE OUTFALLS (PO)	4
UNUSUAL STREAM CONDITIONS (UC)	2
TRASH DUMPING AREAS (TD)	2

SUMMARY

Pipe Outfalls: The area which was of most concern to the survey originated at a concrete pipe located under Riverview Avenue, just below the Tavern (PO #4). The volunteers reported that this pipe had created a "newly discovered drainage ditch", which the volunteers had not been aware of previously. The pipe was reported to be two feet in diameter. It opens into a woodland, forming a dry drainage ditch that leads to the main drainage area. While no other unusual conditions were reported in relation to the pipe, this area was reported to be the site of a significant trash dumping area (See TD#1).

Two pipes, one at Route 50 (PO #1), and the other, which passes under Riverview Avenue (PO #2) serve as a drainage point into the survey section. The volunteers reported an area lined with rip-rap just downstream from PO #1. From that point, the drainage goes underground before reappearing at PO #2. Both concrete pipes are three feet in diameter or greater. The volunteers reported seeing a six inch diameter pipe inside PO #2. They indicated the pipe may have been an illegal hook-up at one time. They reported no evidence of any problems related to this pipe during the time of the survey.

The final outfall (PO #3) was reported to be a drainage pipe for house roof and land area. The one foot diameter pipe is made of flexible plastic. Stones were reportedly placed at the outfall for sediment control. The area around the pipe was dry at the time of the survey. No unusual conditions were reported in connection with the pipe.

Unusual Stream Conditions: At the mouth of this survey section, the volunteers described the area as being "brownish" and "oily", with "scum on the surface" (UC #1). No algae was reported, and the volunteers did not notice any signs of aquatic life.

The volunteers reported the last 60 feet of the survey section (UC #2) to have "stagnant patches of oily, reddish water which would probably be absent if drain water were not trapped by branches and other debris.

Trash Dumping Areas: Both trash areas were reported along and near the drainage area that stems from PO #4. The largest of the trash sites (TD #1) is found in the middle of

the drainage area. The "dump" is obscured by scrub woodland, causing access to be difficult. The volunteers reported the site to be approximately 400 square feet. It contained a variety of large, heavy items, including beds and car parts.

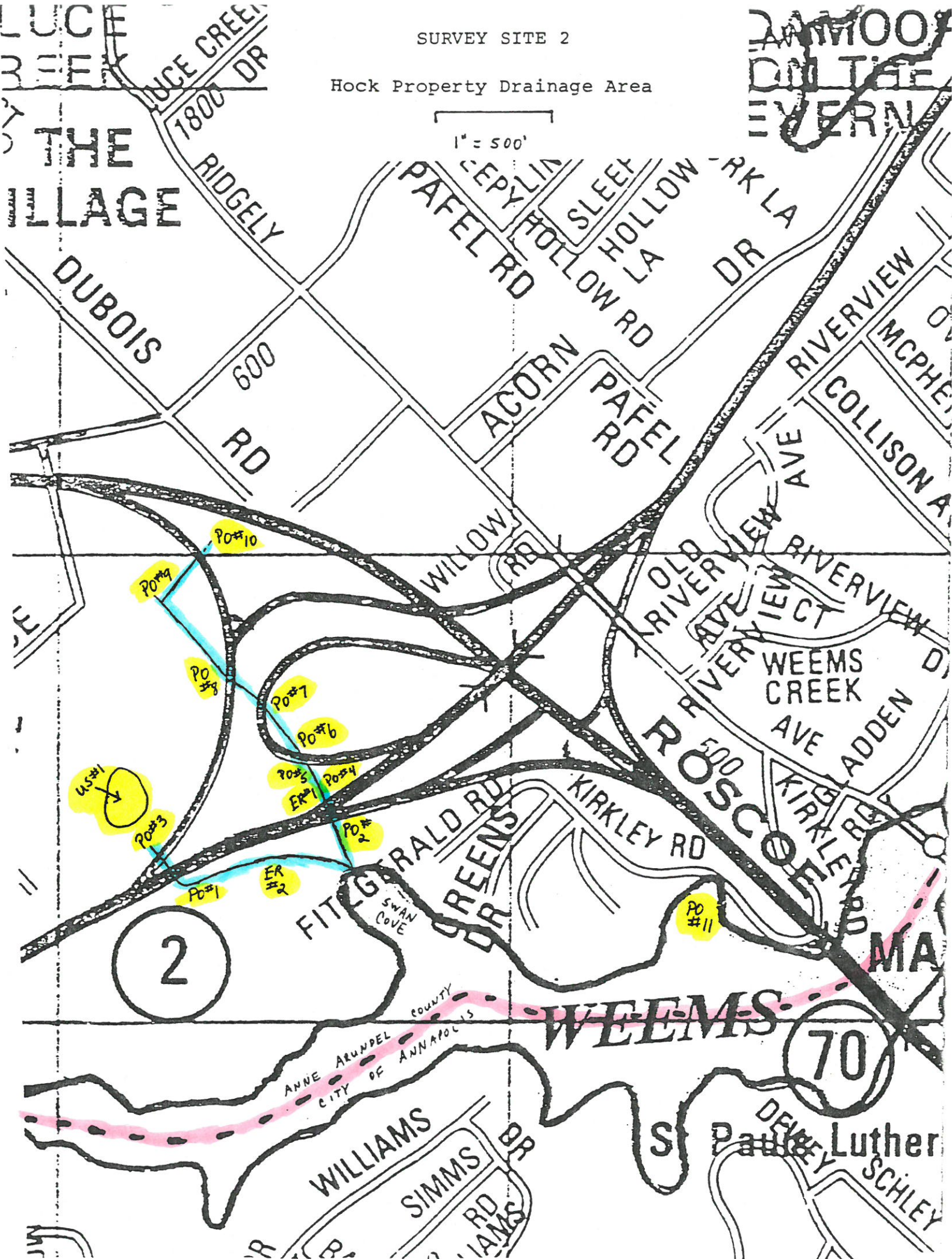
The other trash site (TD #2) was reported further downstream, near the point where the drainage area meets the main survey section. The size of this site was not indicated. Tires and rusty chemical drums were among the items reported at this site.

Notes and Comments: At locations along the survey section where water was observed, water depth was reported to be about three inches. The width of the drainage area was reported to be 16 to 18 inches wide.

SURVEY SITE 2

Hock Property Drainage Area

1" = 500'



2

70

ANNE ARUNDEL COUNTY
CITY OF ANNAPOLIS

St. Patrick's
Luther
Schley

WILLIAMS
SIMMS
RD
LANKS

WEEMS

AMMOO
DULTIE
EVERN

THE
VILLAGE

DUBOIS
RD

RIDGELY
1800 DR

PAFEL RD
SLEEP HOLLOW RD

ACORN
PAFEL RD

DR LA
RIVERVIEW

MCPHEE
COLLISON A

WILLOW
RD

OLD RIVERVIEW
RIVERVIEW DR

WEEMS
CREEK
AVE
ADDEN

RIVERVIEW
ROSCOE
RD

KIRKLEY RD

GREENS
DR

FITZGERALD RD
SWAN COVE

PO #11

MA

US#1

PO#1

ER#2

PO#2

PO#3

ER#1

PO#4

PO#5

PO#6

PO#7

PO#8

PO#9

PO#10

SURVEY SITE 2

LOCATION: HOCK PROPERTY DRAINAGE AREA

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
PIPE OUTFALLS (PO)	11
UNSHADED STREAM SECTIONS (US)	1
EVIDENCE OF EROSION (ER)	2

SUMMARY

Pipe Outfalls: Virtually all of the pipes reported along this survey section (PO #1 - PO #10) were reported to be part of the highway intersection drainage system. The concrete pipes ranged between three and four feet in diameter. Stream beds above Route 50 are lined with stones, according to the volunteers. Some trash was reported downstream from PO #1. Volunteers also reported another pipe (PO #11) at the head of a cove downstream from the survey site, near Kirkley Road. While details regarding the size and type of pipe were not provided, the volunteers noted that the outfall continues to carry silt into Weems Creek.

Unshaded Stream Sections: One area of concern to the volunteers was a 500 foot area of land that had been cleared above PO #3 (US #1).

Evidence of Erosion: Severe channel erosion was reported along a drainage area below PO #1 (ER #2). Volunteers listed the possible cause of this erosion as runoff from the highway and from US #1. The land directly adjacent to ER #2 was described as being forested.

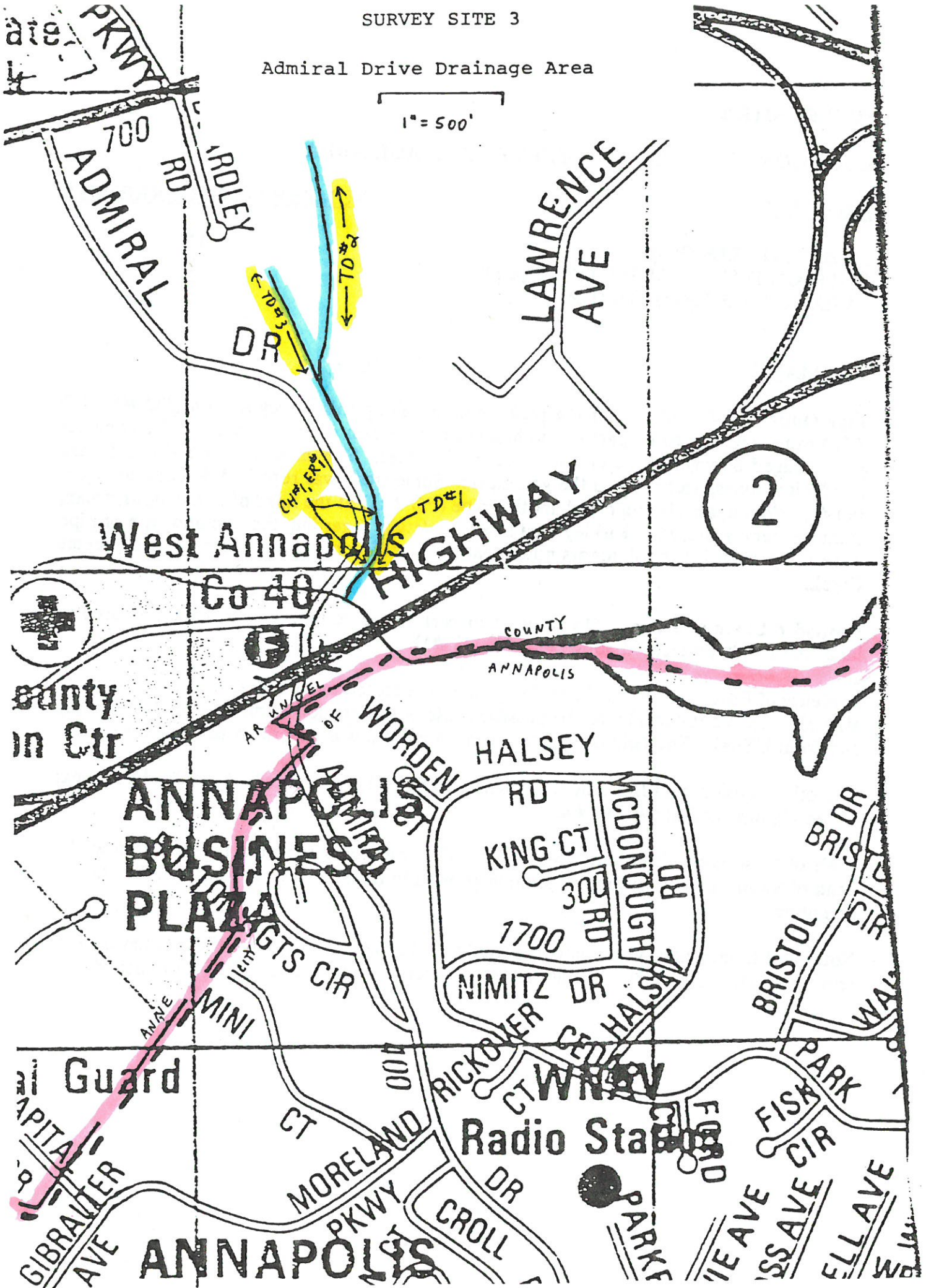
The other erosion area listed by the volunteers (ER #1) was described as a "sinkhole next to the highway and above PO #4.

Both of these areas drain into Swan Cove. The volunteers reported that the area at the head of Swan Cove has swamp vegetation growing in the silt which has entered the cove in recent years.

Notes and Comments: Volunteers reported a silt barrier in Swan Cove that has never been removed. They indicated that the barrier has been breached, and should be removed.

Admiral Drive Drainage Area

1" = 500'



SURVEY SITE 3

LOCATION: ADMIRAL DRIVE DRAINAGE AREA

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
CHANNELIZED SECTIONS (CH)	1
EVIDENCE OF EROSION (ER)	1
TRASH DUMPING AREAS (TD)	3

SUMMARY

Channelized Sections: The volunteers reported a channelized section of stream along Admiral Drive (CH #1). They reported the rate of flow compared to the rest of the stream to be slower. Aquatic life, in the form of frogs, were reported along this area.

Evidence of Erosion: In the vicinity of CH #1, the volunteers reported an area of steep slope erosion (ER #1). Facing upstream, the volunteers reported a very steep bank to the right side, with Admiral Drive to the left. Soil was reportedly falling into the channelized section of the stream.

Trash Dumping Areas: Several significant trash sites were found, particularly along the upstream portion of this survey site. The largest section (TD #2) was reported as being "along a dry river bed off of Old Admiral Road, along side roads". This area consisted of several trash areas along a stretch of dry creek bed running several hundred yards. The volunteers stated that it was along those areas furthest upstream, where the worst sites were located. In these areas, they reported seeing "paint cans, paint thinner cans, washers, plumbing fixtures, and lots of scrap metal".

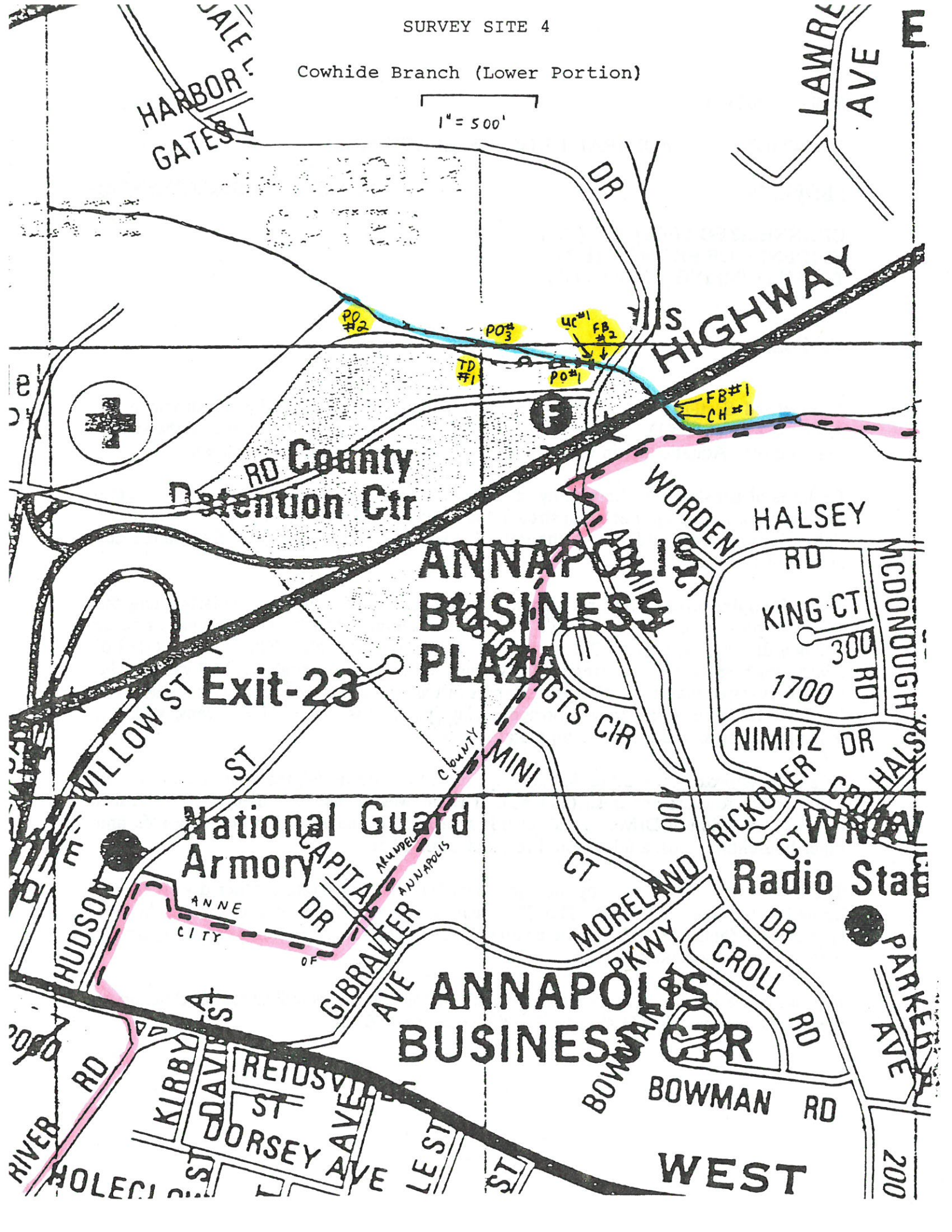
At a point approximately 30 to 40 yards upstream from Route 50, the volunteers reported a 400 square foot area of trash (TD #1). The site was further identified as being near a driveway off Admiral Drive. Trash in this area included construction debris, a sofa and other household items, a television, tires, and an oil filter.

The final trash area reported by the volunteers (TD #3) was along another dry creek bed located to the west of TD #2. This 200 square foot trash site, located in the vicinity of a crop and residential area, contained a variety of old metal scraps including car parts, bicycle parts, and old appliances.

Because of the terrain and surrounding woodland, the volunteers indicated that clean up of these sites, particularly TD #2 and TD #3, would be difficult.

Cowhide Branch (Lower Portion)

1" = 500'



SURVEY SITE 4

LOCATION: COWHIDE BRANCH (LOWER PORTION)

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
FISH MIGRATION BARRIERS (FB)	2
PIPE OUTFALLS (PO)	3
UNUSUAL STREAM CONDITIONS (UC)	1
CHANNELIZED SECTIONS (CH)	1
TRASH DUMPING AREAS (TD)	1

SUMMARY

Fish Migration Barriers: Volunteers described both sides of the Route 50 overpass as a fish migration barrier (FB #1). They reported a "rip-rap barrier" that was three feet wide by one foot high.

Just upstream from the Admiral Drive road crossing (FB #2), the volunteers reported a "rip-rap dam" that was 12 feet wide by six feet high. Shallow water was reportedly running through the culvert at this point.

Pipe Outfalls: Volunteers were most concerned about a series of PVC pipes they reported seeing adjacent to the Harbor Gates project (PO #3). The volunteers described the pipes as being approximately 200 to 300 yards upstream from the Admiral Drive Road crossing. They reported seeing one black PVC pipe that was one inch in diameter, and two black PVC pipes that were two inches in diameter. While no discharge was reported at the time of the survey, the volunteers believed that the pipes may be coming from a swimming pool area at the residential complex.

A concrete pipe, less than three feet in diameter (PO #1) was reported approximately 120 yards north of Admiral Drive. No discharge was reported. Water color was reported to be green/brown, and algae was present at the outfall.

A third pipe (PO #2) was reported across from the County Detention Center. The metal pipe was less than three feet in diameter. As with PO #1, no discharge was reported, algae was present, and water color was reported to be green/brown.

Unusual Stream Conditions: The volunteers listed the area surrounding FB #2 as an unusual stream condition (UC #1). The rip-rap dam east of the sewage pumping station has "created a flooding of the existing area, approximately 120 feet wide". While some unspecified aquatic life was reported, the volunteers described the water in the area as being "unclear and turbid". Algae was also reported in this area.

Channelized Sections: The volunteers described the area of rip-rap under Route 50 (CH #1) as a channelized stream section. Algae was reported in this area, and the volunteers did report seeing aquatic life (a minnow).

Trash Dumping Areas: The volunteers reported an old dump in a 160 square foot area near the stream and across from the County Detention Center (TD #1). Debris found at this site includes concrete and brick rubble, old tin cans, and cable.

Notes and Comments: The volunteers reported that the area most greatly impacted, was the section of stream "from the headwaters of Weems Creek to 100 yards upstream of Admiral Drive". In this area, "erosion control efforts (rip-rap, dam, and concrete culverts) have made a fish barrier and created a reservoir effect".

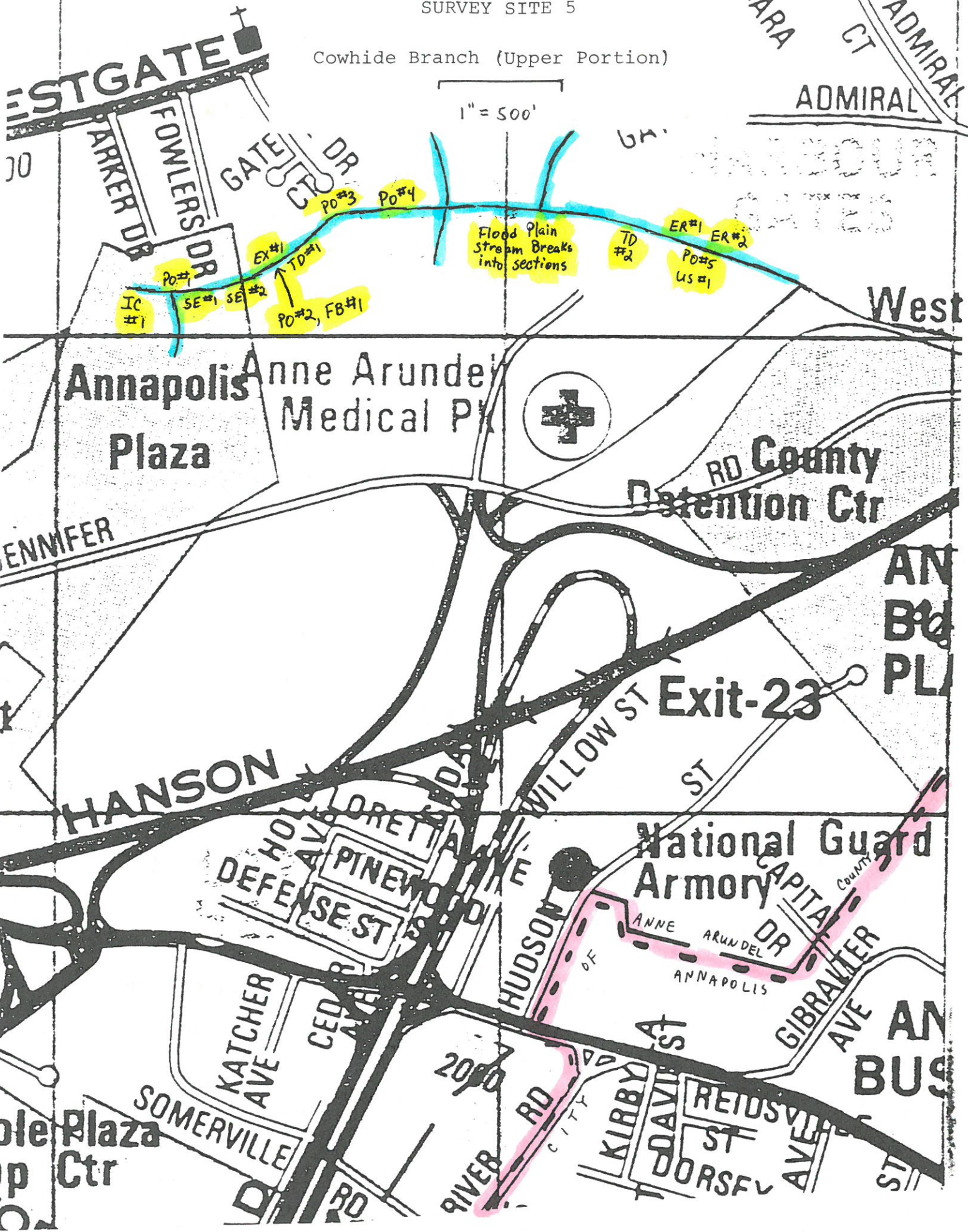
Further upstream, the volunteers described conditions as being "relatively normal". Evidence of small mammals, frogs, turtles, and insects were noted. The stream and surrounding embankments were "amazingly free of trash and evidence of use by humans. In addition to TD #1, the volunteers did report seeing some random tires and one hot water heater along the survey section.

FOWLER

SURVEY SITE 5

Cowhide Branch (Upper Portion)

1" = 500'



WESTGATE
 PARKER DR
 FOWLERS DR
 GATE CT
 DR

PARA CT
 ADMIRAL CT
 ADMIRAL
 HARBOUR GATES

Annapolis
 Anne Arundel
 Medical Plaza

RD County
 Detention Ctr

ENNIFER

AN
 Bldg
 PL

Exit-23

HANSON

HO AV
 DRETTA
 PINWOOD
 DEFENSE ST

National Guard
 Armory

ANNE ARUNDEL
 ANNAPOLIS

CAPITAL
 DR
 GIBRALTER
 AVE

AN
 BUS

ole Plaza
 ip Ctr

SOMERVILLE

2000
 RIVER RD
 CITY

KIRBY ST
 DAVIE ST
 REIDSVILLE
 ST
 DORSEY AVE

SURVEY SITE 5

LOCATION: COWHIDE BRANCH (UPPER PORTION)

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
EXPOSED SECTIONS OF SEWER LINE (EX)	1
FISH MIGRATION BARRIERS (FB)	1
PIPE OUTFALLS (PO)	5
IN-STREAM CONSTRUCTION ACTIVITY (IC)	1
UNSHADED STREAM SECTIONS (US)	1
EVIDENCE OF EROSION (ER)	2
TRASH DUMPING AREAS (TD)	2
SEDIMENT LOADING (SE)	2

SUMMARY

Exposed Sections of Sewer Line: Volunteers reported seeing a "cement water pipe adjacent to the stream" at the upstream portion of the survey site (EX #1). This was further described as being an "abandoned cement pipe", which has been capped off.

Fish Migration Barriers: Northeast of Annapolis Plaza, the volunteers reported a rip-rap discharge point in the stream (FB #1) with an estimated height of 18 inches.

Pipe Outfalls: Three of the reported outfalls (PO # 1 - PO #3) are located near the Annapolis Mall and Annapolis Plaza, and are associated with the stormwater management system for the commercial property. PO #1 was described as a metal pipe, greater than three feet in diameter, located east of the Mall. No discharge was reported at the time of the survey. A small amount of greenish, drying algae was reported in the vicinity of the pipe. Water color was described as medium brown, and no unusual odors were reported.

PO #2, a stormwater management drain located northeast of Annapolis Plaza, was described as being a metal pipe less than three feet in diameter. Some discharge was reported at the time of the survey. Natural foam was also reported in this area. No unusual water odors were reported.

Further east, to the rear of Annapolis Plaza, the volunteers reported a three foot concrete pipe. This pipe, PO #3, was not discharging. Green algae was reported. Water color was described as being clear. Some sediment and rip-rap was also reported. Volunteers reported no water odors.

East of Annapolis Plaza, near Gate Drive, the volunteers reported a discharging metal pipe of unknown origin (PO #4). This pipe was less than three feet in diameter. Volunteers reported the water to be "soapy", and they described the water to have a chlorine odor. The pipe was further described as being near a brick head wall, with no surrounding vegetation.

The final pipe reported by the volunteers (PO #5) was described as being behind (west of) the Medical Facility. The pipe was further described as being a cement head-drain in a large rip-rap area. Some wood debris was found in the stream at this site.

In-Stream Construction: Volunteers listed the Mall expansion project (IC #1), with the placement of rip-rap for filtration purposes. The volunteers reported 20% exposed soil at the construction site and no sediment-laden discharge from the site at the time of the survey. Other portions of the construction site were reported to be seeded and stable.

Unshaded Stream Sections: Approximately five to ten trees could be planted along the rip-rap area near PO #5 (US #1).

Evidence of Erosion: The beginning stages of both channel and steep slope erosion were reported by the volunteers behind the Medical Facility (ER #1). Sediment from construction activity was listed as the possible cause of the erosion. The volunteers indicated that "once stabilized, the sediment will stop. The construction site was reported to be approximately 200 feet from the stream channel. An estimated 10% of the five acre site was reported to be exposed soil at the time of the survey.

A short distance downstream, another area of steep slope erosion in its beginning stages (ER #2) was reported. This area was described as being behind the Medical Facility at Jennifer Road. Possible causes for the erosion were listed as "offside flows directed to this area". The volunteers reported runoff from manmade slopes, and said scouring is evident. The site was reported to be 200 - 300 feet from the stream channel. An estimated 5% of the site in this area consisted of bare exposed soil.

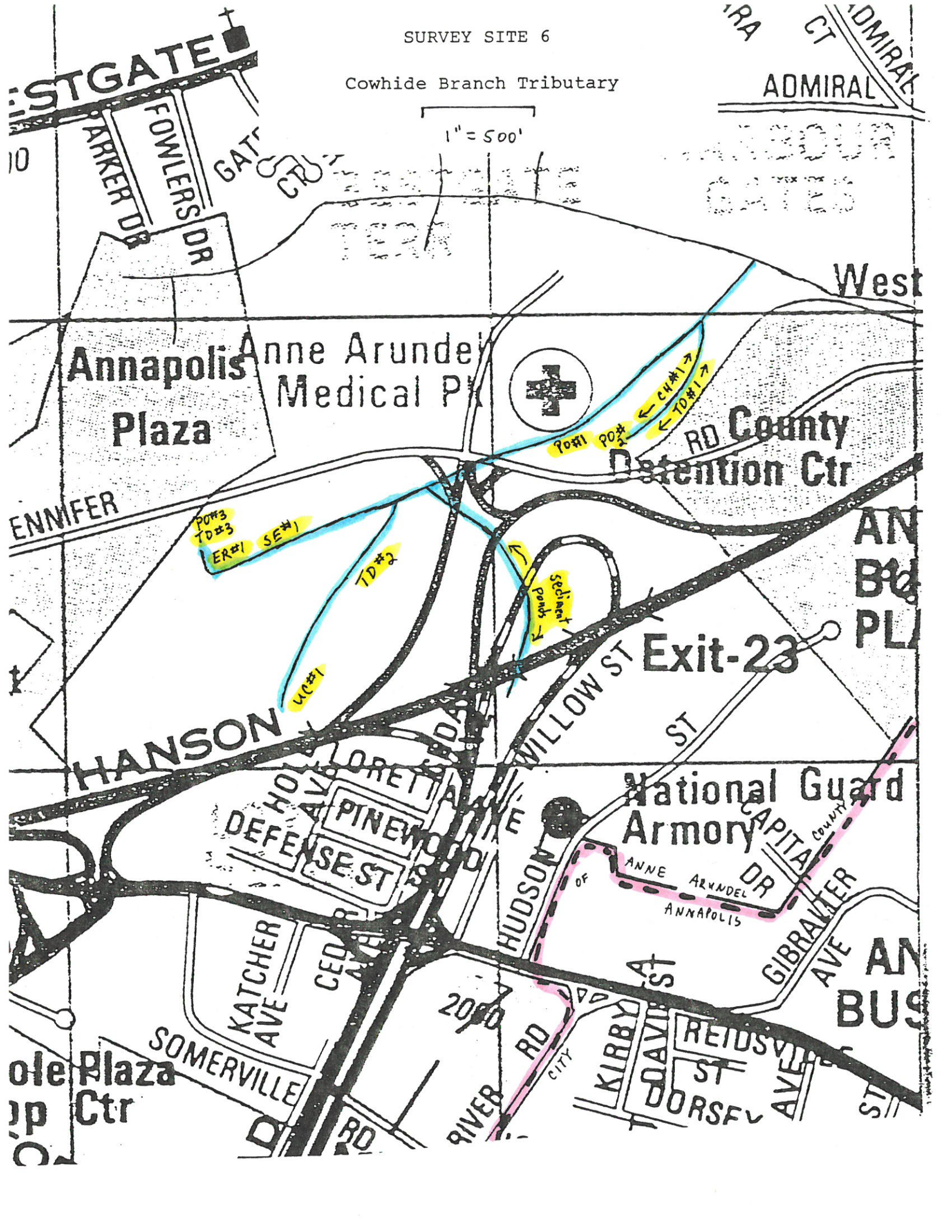
Trash Dumping Areas: Volunteers reported a trash dumping area near the corner of Annapolis Plaza (TD #1). Large solid waste items such as sofas and refrigerators were reported to be scattered in and around the stream. One of the volunteers estimated that between three and five workers would be needed to clean up this site.

An extensive area of concrete and other items created a "dumping area" further downstream (TD #2). This area was along a slope which leads down into a flood plain.

Sediment Loading: Extensive sediment loading (SE #1, SE #2) was reported in the upper reaches of the survey site, east of the Mall, below the rip-rap. Along this section, the volunteers reported seeing lots of iron oxide deposits and natural debris along the channel and banks. They also reported seeing sediment deposits in the floodplain. Side bars and center bars of sediment were observed in the stream channel. Past construction was listed as a possible cause of this problem. The volunteers noted that the area was beginning to be stabilized. Further downstream, beyond the Medical Center, the volunteers reported sediment deposition in the floodplain to be not as evident.

Cowhide Branch Tributary

1" = 500'



Annapolis Plaza

Anne Arundel Medical Plaza

County Detention Ctr

Exit-23

National Guard Armory

ANNE ARUNDEL COUNTY ANNAPOLIS

WESTGATE

ADMIRAL

West

ANNE ARUNDEL COUNTY ANNAPOLIS

ANNE ARUNDEL COUNTY ANNAPOLIS

Old Plaza

Map Ctr

SURVEY SITE 6

LOCATION: COWHIDE BRANCH TRIBUTARY

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
PIPE OUTFALLS (PO)	3
UNUSUAL STREAM CONDITIONS (UC)	1
CHANNELIZED SECTIONS (CH)	1
EVIDENCE OF EROSION (ER)	1
TRASH DUMPING AREAS (TD)	3
SEDIMENT LOADING (SE)	1

SUMMARY

Pipe Outfalls: Volunteers reported seeing one pipe outfall (PO #1) near the Detention Center and Medical Center. The metal pipe, which was surrounded by concrete, was 18 inches in diameter. No discharge was reported at the time of the survey. Very slight traces of algae were reported, and water color was described as being green/brown. No odors were reported.

A second "pipe" (PO #2) was actually an opening with a metal grate that appeared to direct runoff from Jennifer Road and down a concrete channel into the stream. This opening was located on the bank above the stream, directly below the parking lot. The opening was less than three feet in diameter. There was no discharge at the time of the survey.

A concrete pipe, approximately three feet in diameter (PO #3) was reported behind Annapolis Plaza, between a boat supply store and Davidson Beauty Supply. There was no discharge at the time of the survey. The pipe appears to serve as a drainage point for the Plaza.

Unusual Stream Conditions: Near a road culvert which passes under Route 50, volunteers reported heavy seeing heavy blotches of cloudy film in stagnant water (UC #1). No algae was reported. No aquatic life was observed in this area.

Channelized Sections: A concrete channel, running for several hundred feet (CH #1) serves as a drainage point for PO #2, and is not part of the stream channel. A slight bit of downstream sedimentation was observed by the volunteers. No downstream erosion was reported. The channel was dry at the time of the survey.

Evidence of Erosion: Volunteers reported severe erosion along a 350 foot section (ER #1) located at the beginning of the stream, and downstream from PO #3. The area immediately surrounding the erosion was forested. However, volunteers believed runoff from PO #3 may be causing the erosion.

Trash Dumping Areas: A fairly large area of trash (TD #1) was located in the vicinity of PO #2 and CH #1. Volunteers estimated that ten to twenty people would be needed to clean this 400 - 500 square foot area, which is mostly littered with bottles and cans.

An estimated five to ten people would be needed to clean up an area of scattered trash and debris (TD #2) located upstream from the Route 50 on-ramp and downstream from UC #1. Volunteers reported seeing several tires, a downed silt fence and dozens of bottles and cans scattered over an 80 - 100 square foot area.

By far, the largest trash area along this survey site was located just below PO #3. Although this area (TD #3) contained primarily light debris such as bottles, cans and plastic, volunteers reported the trash scattered about a 1,000 square foot area. They estimated between 20 and 50 people would be required to conduct a clean up.

Sediment Loading: The bulk of this survey section had a lot of sand sediment, according to the volunteers, who also indicated that four to five year old growth, in the form of small shrubs and trees, encompass the stream bed.

The most severe example of sediment loading (SE #1) appeared along a section of stream directly below ER #1. Volunteers said this area had several sandbars that were at least 10 square feet in size. A number of them extended more than half-way across the stream channel. In the area around and along ER #1, the stream channel was 6 - 7 feet wide at its broadest points, with banks that were 7 - 10 feet high. At the point where SE #1 is reported, the channel blows out to a width of 15 - 20 feet in some locations. Water flow at the time of the survey was narrow, perhaps three feet wide.

Notes and Comments: Volunteers indicated that the streambank is wider downstream than upstream. Much of the stream channel was dry at the time of the survey. In areas where there was water flowing, the volunteers described the water to be generally clear. A series of sediment ponds along a small sub-tributary cause the stream to essentially end at the Route 50 cloverleaf.

SURVEY SITE 7

West Street Drainage

1" = 500'

HARBOR GATES LA

AUMIKAL DR

LAWRENCE AVE

HARBOR GATES

West Annapolis

Co 40

HIGHWAY

RD County Detention Ctr



WORDEN ADMIRAL ST

HALSEY RD

KING CT 300 RD 1700

Exit-23

WILLOW ST HUDSON ST

PO#2 PO#3 TD#3 TD#4 TD#5 ER#1 PO#1

National Guard Armory

NIMITZ DR

Radio Station

ANNAPOLIS BUSINESS CENTER

GIBRALTER AVE KIRBY ST DAVID ST REIDSVILLE ST

MORELAND ST BOWMAN PKWY CROLL RD BOWMAN DR PARKED AVE

SURVEY SITE 7

LOCATION: WEST STREET DRAINAGE

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
PIPE OUTFALLS (PO)	3
UNUSUAL STREAM CONDITIONS (UC)	2
EVIDENCE OF EROSION (ER)	1
TRASH DUMPING AREAS (TD)	3

SUMMARY

Pipe Outfalls: A concrete pipe, located at the very beginning of the stream bed (PO #1) serves as a drainage point for a residential and commercial area, according to the volunteers. The pipe was greater than three feet in diameter. Water color downstream was described as being reddish brown and oily.

Approximately 100 yards downstream from ER #1, volunteers reported a concrete/metal pipe (PO #2) that was less than three feet in diameter. Water color was dark brown, and stones in the vicinity had a silty covering. No unusual odors were detected.

A concrete and metal pipe, less than three feet in diameter, was reported below the parking area of a large apartment complex off of Admiral Drive (PO #3). The stream bed in this area was dry at the time of the survey.

In the case of all three pipes, volunteers reported no discharge and no algae.

Unusual Stream Conditions: Just downstream from PO #1, and near a white PVC pipe in the middle of the stream bed, the volunteers reported the stream to be "red and oily" (UC #1). The condition continued for approximately 50 yards downstream until it eventually dissipated. However, volunteers reported this condition to re-occur at various points along the length of the stream. This condition was particularly noticed below ER #1 (UC #2).

Evidence of Erosion: Medium steep slope and channel erosion was reported behind the parking lot of the "mini-warehouses" complex (ER #1). Volunteers indicated that the erosion seemed to be caused by natural occurrences.

Trash Dumping Areas: While the volunteers indicated a distribution of trash throughout the survey area, the heaviest concentrations were in the vicinity of the "mini-warehouses" complex and the large apartment complex off Admiral Drive (TD #1, TD #2, TD #3). The volunteers said that because access to the stream is difficult, trash removal would be equally difficult. Large, bulky items were mixed in with lighter debris. The volunteers said "cleaning the stream of trash would take many people many hours".

Notes and Comments: The volunteers indicated that some of the trash appeared to be a direct result of PO #2. They recommend the placement of a grate to collect the trash emitted from this site.

SURVEY SITE 8

Tributary of West Street Drainage

1" = 500'

HARB' GATES LA

ADMIRAL DR

LAWRENCE AVE

HARBOUR GATES

West Annapolis Highway Co 48

RD County Detention Ctr



WORDEN ADMIRAL ST

HALSEY RD

KING CT

300 RD

1700 RD

NIMITZ DR

Radio Station

Exit-23

ANNAPOLIS BUSINESS CENTER

WILLOW ST

Marsh Area

CAPITOL ANNAPOLIS CITY DR

GIBRAITER AVE

MORELAND CT

RICKOVER CT

CROLL DR

BOWMAN PKWY

BOWMAN DR

PARKED AVE

KIRBY ST

REIDSVILLE ST

idel PK

HUDSON ST

20th RD

PO#1

PO#2

PO#3

PO#4

PO#5

PO#6

PO#7

PO#8

PO#9

PO#10

PO#11

PO#12

PO#13

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PO#88

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PO#90

PO#91

PO#92

PO#93

PO#94

PO#95

PO#96

PO#97

PO#98

PO#99

1000 RD

SURVEY SITE 8

LOCATION: TRIBUTARY OF WEST STREET DRAINAGE

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
PIPE OUTFALLS (PO)	4
UNUSUAL STREAM CONDITIONS (UC)	2
EVIDENCE OF EROSION (ER)	1
TRASH DUMPING AREAS (TD)	1
SEDIMENT LOADING (SE)	1

SUMMARY

Pipe Outfalls: A "concrete ramp following a metal pipe" was reported on the side of a slope near a cement plant on Hudson Street (PO #1). The pipe was less than three feet in diameter. No discharge was reported at the time of the survey. No algae or unusual odors were reported. Water color in the vicinity was reported to be "concrete gray".

A pipe that appears to serve as a drainage point for Hudson Street (PO #2) was located behind a white and brown building which houses American Security Storage. The concrete pipe was approximately two feet in diameter. Discharge was reported by the volunteers at the time of the survey. Water color in the immediate area was described as being cloudy white. No unusual odors were reported. No aquatic life was observed in the vicinity of the pipe.

A drainage pipe for West Street (PO #3) was found at the head of the stream, near West Street, across the street from the Annapolis Antique Gallery. Two concrete pipes, both of them approximately two feet in diameter, are located at this site. Volunteers reported no discharge at the time of the survey. There were no unusual water colors or odors at the pipes or immediately downstream. There were no signs of aquatic life.

The fourth pipe along this survey site (PO #4) was located behind the building which houses The Capital newspaper. Volunteers reported a slight discharge from the concrete pipe, which is approximately one and one-half feet in diameter. Water color was described as being "mostly clear except for a thin film on the surface". No unusual odor was reported. No algae was reported and there were no signs of aquatic life.

Unusual Stream Conditions: Approximately 350 yards downstream from PO #1, volunteers reported seeing an orange-brown goopy, jelly-like substance (UC #1). Oil was interspersed in this area, and there were some small but noticeable areas of sediment.

Directly below PO #2, (UC #2) volunteers reported the water to be "cloudy white, leaving a sudsy residue and causing a dark gray layer on the soil". No algae was reported in this area. There were no signs of aquatic life.

Evidence of Erosion: Significant and severe bank erosion (ER #1) was reported in the headwaters region, below PO #3. This erosion extended from PO #3, downstream to PO #2. Stormwater runoff from PO #3 was believed to be the cause of the erosion.

Immediately downstream from PO #2, a relatively small but very distinct area of erosion was reported (ER #2). Water flow coming from the pipe dropped five feet before reaching the main stream bed.

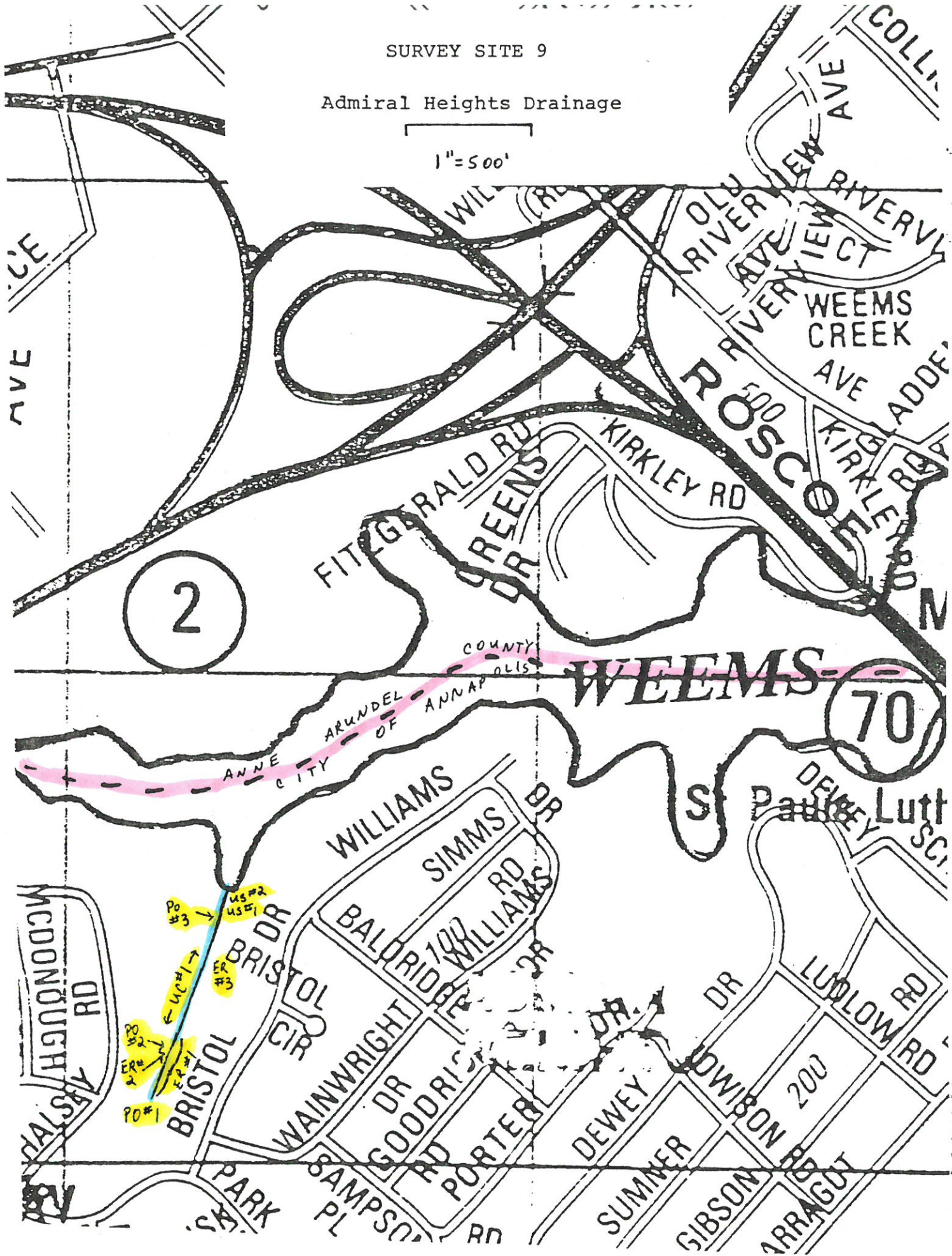
Trash Dumping Areas: Directly below PO #3, in an area encompassing approximately 10,000 square feet, a substantial amount of trash was noted by volunteers (TD #1). The area is bounded by commercial businesses on one side and industrial activities on the other. The trash consisted of large objects such as tires, metal drums, and construction material. In addition, a significant amount of small debris including bottles, cans, and plastic containers was also noted. It was estimated that at least 100 people would be needed for a cleanup.

Sediment Loading: Approximately 150 yards downstream from PO #1, it was observed that the width of the channel expanded dramatically. While the beginning of the stream had seven feet banks and a width of approximately five feet, this area had a much lower slope, and a streambank width reaching 25 feet. At this point (SE #1), a great deal of sedimentation was occurring, with a sandbar extending more than halfway across the channel. The size of the bar was about 400 square feet. The cause of the problem was thought to be upstream pipe outfalls. No signs of aquatic life were reported in this area.

SURVEY SITE 9

Admiral Heights Drainage

1" = 500'



SURVEY SITE 9

LOCATION: ADMIRAL HEIGHTS DRAINAGE

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
PIPE OUTFALLS (PO)	3
UNUSUAL STREAM CONDITIONS (UC)	1
UNSHADED STREAM SECTIONS (US)	2
EVIDENCE OF EROSION (ER)	3

SUMMARY

Pipe Outfalls: Two concrete and metal pipes, both approximately four feet in diameter (PO #1), were reported at the "head of the stream, 100 feet from Cedar Park". Volunteers reported that the pipes were discharging at the time of the survey. Water color was described as being clear, and no unusual odors were reported.

Approximately 100 feet downstream from PO #1, on the left bank of the stream approximately 100 feet from the channel, the volunteers reported a concrete pipe three feet in diameter (PO #2). No discharge was reported. The volunteers did report erosion below the apron (see ER #2).

Another 300 feet downstream, a third pipe was reported (PO #3). This three foot diameter concrete pipe is located on the left bank of the stream, approximately 100 feet from the stream channel. No discharge was reported, but the volunteers indicated the "apron has collapsed".

Unusual Stream Conditions: Throughout the survey site, volunteers reported seeing an orange substance which they believed to be "algae or colloidal matter" (UC #1). The volunteers did report seeing signs of aquatic life, and black color on deeply imbedded stones.

Unshaded Stream Sections: At the mouth of the survey section, where the stream enters Weems Creek (US #1), the volunteers reported a 100 foot strip of marsh. Another 200 feet upstream, on the right side of the flood plain (US #2), the volunteers reported a 150 foot section of dense vegetation, consisting of vines, briars, weeds, and saplings that were between four and five feet high.

Evidence of Erosion: Severe channel erosion was reported immediately below PO #1 (ER #1). This area of erosion continued for 150 feet downstream along the right bank of the stream channel. The volunteers listed a failure of gabions and rip-rap below PO #1, and periods of high stormwater runoff as a possible cause of the erosion.

A "pothole", approximately six feet in diameter, and five feet deep, was reported at the point where drainage from PO #2 enters the stream (ER #2).

Further downstream, the volunteers reported another section of severe channel erosion (ER #3). They listed undercutting during periods of high runoff as the possible cause of erosion along this section.

Notes and Comments: The volunteers reported that "trash is distributed along the entire stream and appears to be primarily from storm drain runoff rather than on-site littering". No concentrated dumping areas were reported by the volunteers.

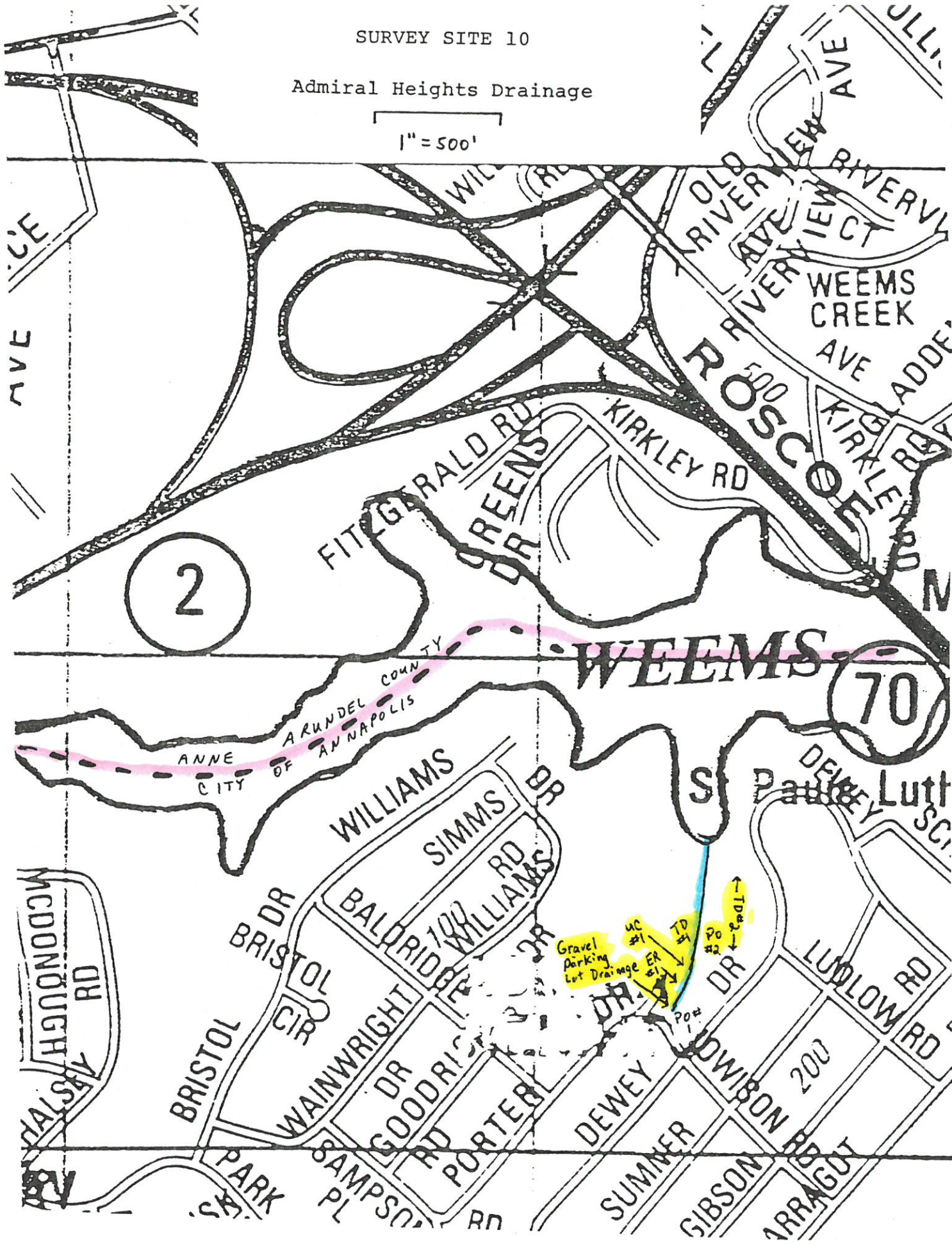
The area listed as US #1 "was probably a marsh/wetland, separated from Weems Creek by a (sand) bar which now supports a band of trees between US #1 and US #2.

The volunteers reported the stream bed to be between four and six feet below the land. At the mouth of the survey section, the flood plain widens to approximately 100 feet. The current channel follows the right edge of the flood plain, then crosses to the left side about 2/3 of the way down, just above US #1.

SURVEY SITE 10

Admiral Heights Drainage

1" = 500'



SURVEY SITE 10

LOCATION: ADMIRAL HEIGHTS DRAINAGE

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
PIPE OUTFALLS (PO)	2
UNUSUAL STREAM CONDITIONS (UC)	1
EVIDENCE OF EROSION (ER)	1
TRASH DUMPING AREAS (TD)	2

SUMMARY

Pipe Outfalls: A three foot diameter concrete pipe was reported near the intersection of Howison Road and Porter Street (PO #1). The volunteers reported the pipe to be discharging at the time of the survey. Water color was reported to be clear. Both algae and signs of aquatic life were present.

Approximately 350 to 400 feet downstream, the volunteers reported a second stormwater outfall (PO #2), about 75 feet east of the stream. The concrete pipe was greater than three feet in diameter. Discharge was reported at the time of the survey. Water color was clear. No algae was reported. Volunteers further described this site as a "rock control (rip-rap) project" which has been "partially successful".

Unusual Stream Conditions: Volunteers reported an increase in the stream gradient approximately 250 feet downstream from Howison Road (UC #1). Construction rubble, including asphalt, had reportedly been dumped in this area.

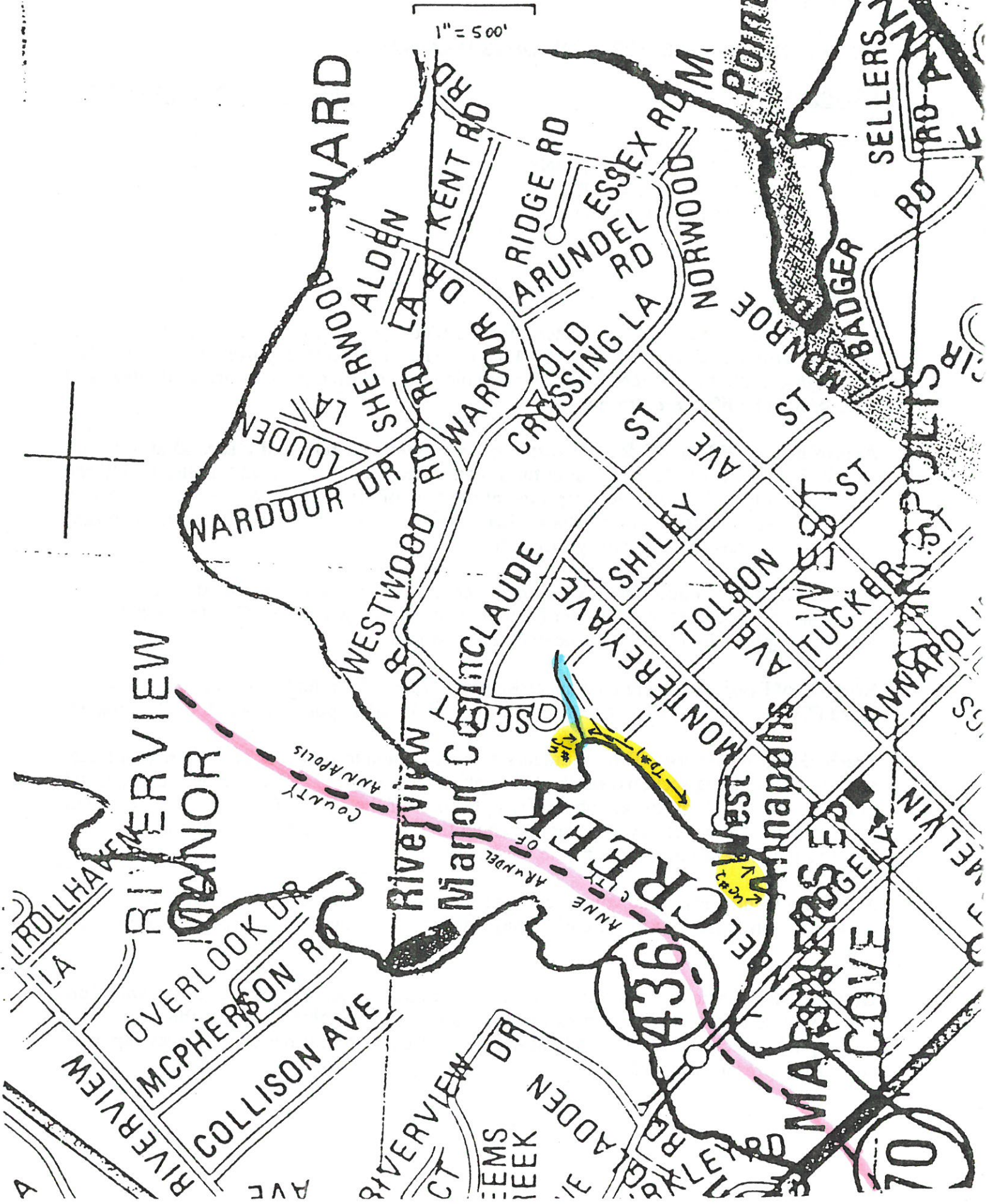
Evidence of Erosion: Severe channel erosion was reported 200 feet downstream of Howison Road (ER #1). Stormwater runoff and trash were listed as possible causes of the erosion.

Trash Dumping Areas: The volunteers reported "numerous areas of rubble (concrete, asphalt, drain piping sections) on the left bank of the stream (TD #1), along the upper 2/3 of the channel". Homeowners above the right bank of the stream (TD #2) have "dumped considerable yard waste down the slope behind their lots, but none of the solid material has reached the stream", according to the volunteers.

Notes and Comments: The volunteers reported drainage from a gravel parking lot 50 feet from Howison Road into the stream. They listed the location as an active community swim club.

Orange algae was noted from the mouth to an area approximately 100 feet upstream. This appears to be the limit of tidal conditions, according to the volunteers. At this location, a "black pool" which the volunteers believe may have been the former channel was reported east of the present channel.

West Annapolis Drainage



1" = 500'



ANNE ARUNDEL COUNTY
West Annapolis

ANNE ARUNDEL COUNTY
West Annapolis

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75#

75#

75#

A

AVE

DR

DR

DR

DR

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SURVEY SITE 11

LOCATION: WEST ANNAPOLIS DRAINAGE

<u>PROBLEM</u>	<u>NUMBER OF OCCURRENCES</u>
UNUSUAL STREAM CONDITIONS (UC)	2
TRASH DUMPING AREAS (TD)	1

SUMMARY

Unusual Stream Conditions: Volunteers reported a heavy scum along the lee shore, near the mouth of the drainage area (UC #1). In the area near the end of Annapolis, volunteers reported seeing "lots of oil in the creek" (UC #2).

Trash Dumping Areas: Some light, wind blown trash which the volunteers believe is blown in from the creek, was reported in the vicinity of the drainage area (TD #1).

Notes and Comments: This section of stream was surveyed on September 26, 1993. Volunteers described the survey area as not being a clearly defined stream. Rather, it was more of a wetland area. Lots of vegetation including grasses and cat tails were present.

A strong smell of sewage was present in the area. Volunteers attributed this to a nearby pumping station. A black, mucky substance was also reported in this general area.

Volunteers said much silt enters the creek when it rains, and said no underwater vegetation is growing in the vicinity of their survey area.

The volunteers did report seeing a wide variety of fish, waterfowl, and other wildlife, including a blue heron, egrets, osprey, white perch, bluegills, and crabs.

OVERALL SUMMARY OF FINDINGS

The following table provides the reader with an overall summary of findings during the Weems Creek Tributary survey:

SURVEY SITE

FINDING	1	2	3	4	5	6	7	8	9	10	11	TOTAL
Exposed Sections of Sewer Line	0	0	0	0	1	0	0	0	0	0	0	1
Overflow Points	0	0	0	0	0	0	0	0	0	0	0	0
Fish Migration Barriers	0	0	0	2	1	0	0	0	0	0	0	3
Pipe Outfalls	4	11	0	3	5	3	3	4	3	2	0	38
Unusual Stream Conditions	2	0	0	1	0	1	2	2	1	1	2	12
Channelized Sections of Stream	0	0	1	1	0	1	0	0	0	0	0	3
In-Stream Construction Activity	0	0	0	0	1	0	0	0	0	0	0	1
Unshaded Stream Sections	0	1	0	0	1	0	0	0	2	0	0	4
Evidence of Erosion	0	2	1	0	2	1	1	1	3	1	0	12
Trash Dumping Areas	2	0	3	1	0	3	3	1	0	2	1	16
Sediment Loading	0	0	0	0	2	1	0	1	0	0	0	4

Some of the more significant observations during the stream survey included the following:

- 1) **EXPOSED SECTIONS OF SEWER LINE (EX)**--Volunteers listed only one exposed section of sewer line.

This report, identified along the upper portion of Cowhide Branch, may not have been a sewer line. Volunteers described the object as being a "cement water pipe adjacent to the stream". The object was further described as being an abandoned cement pipe, which has been capped off.

- 2) **OVERFLOW POINTS (OP)**--During the survey, volunteers reported no points at which evidence of current or recent sewage overflows or septic failures. Reports of sewage odors were also limited, and pertained primarily to the close proximity of sewage pumping stations.

- 3) **FISH MIGRATION BARRIERS (FB)**--Three possible fish migration barriers were listed by the volunteers.

All three were located along the main stem of Cowhide Branch. Along the lower portion of the tributary, a rip-rap barrier along both sides of the Route 50 overpass, and a "rip-rap dam" just upstream from Admiral Drive were listed as barriers by volunteers. The other reported barrier was a rip-rap discharge point in the stream, Northeast of Annapolis Plaza.

- 4) **PIPE OUTFALLS (PO)**--Volunteers reported 38 pipe outfalls along the various tributaries flowing into Weems Creek.

Some degree of discharge was reported from several pipes. A pipe that appeared to serve as a drainage point for impervious surfaces along Hudson Street (See Site 8, PO #2) had reports of discharge. Some discharge was reported from a metal pipe located northeast of Annapolis Plaza (see Survey Site 5, PO #2).

Three pipes in Admiral Heights were reported to have some amount of discharge at the time of the survey. Volunteers reported two concrete and metal pipes, both approximately four feet in diameter at the "head of the stream, 100 feet from Cedar Park" (See Survey Site 9, PO #1). Both pipes were discharging at the time of the survey.

Meanwhile, a three foot diameter concrete pipe was reported near the intersection of Howison Road and Porter Street (See Survey Site 10, PO #1). Approximately 350 to 400 feet downstream, the volunteers reported a second stormwater outfall (See Survey Site 10, PO #2), about 75 feet east of the stream. The concrete pipe was

greater than three feet in diameter. Discharge was reported at the time of the survey.

With the exception of the Hudson Street Drainage point, no unusual stream conditions were reported in the immediate vicinity of these discharging pipes.

Other pipes which raised concerns included plastic PVC piping which appeared to lead from a swimming pool area down to the lower end of Cowhide Branch (See Survey Site 4, PO #1), a "concrete ramp following a metal pipe", reported on the side of a slope near a cement plant on Hudson Street (See Survey Site 8, PO #1), and a pipe at the head of a cove near Kirkley Road (See Survey Site 2, PO #11) which according to volunteers, continues to carry silt into Weems Creek.

- 5) **UNUSUAL STREAM CONDITIONS (UC)**--Reports of 12 unusual stream conditions were recorded by the volunteers.

Exactly one-half of these findings included the presence of oil. The most severe instances of this reporting appeared to be in the West Street area (See Survey Site 7, UC #1 and UC #2, and Survey Site 8, UC #1). Along Survey Site 7, volunteers reported a "red and oily" condition along significant lengths of the stream channel.

Noticeable traces of oil were also reported in the Riverview Manor area (See Survey Site 1, UC #1 and UC #2) and West Annapolis (See Survey Site 11, UC #1).

- 6) **CHANNELIZED SECTIONS OF STREAM (CH)**--Volunteers listed three areas of "channelization".

One location served as a stormwater runoff point rather than the construction of a channel within the stream bed (See Survey Site 6, CH #1). The other two were in the vicinity of the Route 50 overpass near the tidal headwaters of Weems Creek (See Survey Site 3, CH #1 and Survey Site 4, CH #1). No major problems associated with these sites were reported.

- 7) **IN-STREAM CONSTRUCTION ACTIVITY (IC)**--One report of in-stream construction activity was listed by the volunteers at the time of the survey.

Volunteers listed the Annapolis Mall expansion project under this heading. At the time of the survey, volunteers reported 20% exposed soil and no sediment laden discharge from the site.

Volunteers surveying near Route 50 did note seeing an old silt barrier in Swan Cove that has not been removed. They indicated the barrier has been breached, and should be removed.

- 8) **UNSHADED STREAM SECTIONS (US)**--There were only four reports of unshaded stream sections by the volunteers.

The largest of these areas was between Lawrence Avenue and the Route 50/Rowe Boulevard cloverleaf (See Survey Site 2, US #1). Volunteers reported a 500 foot area of land that had been cleared of trees.

A much smaller area was reported behind the Medical Facility (See Survey Site 5, US #1) where volunteers said five to ten trees could be planted along a rip-rap area.

The other two reports, both in the Admiral Heights area, were along marshy, tidal areas, where dense, low-lying vegetation was reported in abundance.

- 9) **EVIDENCE OF EROSION (ER)**--Twelve reports of erosion were recorded by the volunteers.

In most cases where volunteers described the erosion as being "severe", the eroded section of stream was located directly below a reported pipe outfall. This was the case at a point just upstream from Swan Cove (See Survey Site 2, ER #2), a section of stream behind Annapolis Plaza (See Survey Site 6, ER #1), a drainage area near West Street (See Survey Site 8, ER #1), a drainage area below a pipe near Cedar Park (See Survey Site 9, ER #1), and a drainage area just below Howison Road (See Survey Site 10, ER #1)

- 10) **TRASH DUMPING AREAS (TD)**--Survey volunteers identified 16 areas of trash which they determined to be significant enough to report.

A number of sites, while large, were not easily accessible and reported to be difficult for clean up purposes. These sites included an area below The Tavern on Riverview Avenue (See Survey Site 1, TD #1), and a number of trash sites in the vicinity of Admiral Drive and Old Admiral Road (See Survey Site 3, TD #1, TD #2, and TD #3; Also See Survey Site 7, TD #1, TD #2, and TD #3).

Some areas of trash are more readily accessible, and conducive to a community clean up effort. These sites include a major trash area just off West Street (See Survey Site 8, TD #1), an area behind the Annapolis Plaza (See Survey Site 6, TD #3), and a relatively small area of large, bulky trash near the northeast corner of Annapolis Plaza (See Survey Site 5, TD #1)

- 11) **SEDIMENT LOADING (SE)**--Four reports of sediment loading were recorded by the volunteers.

All four reports came from the uppermost reaches of the watershed. Volunteers surveying the upper portion of Cowhide Branch reported extensive sediment loading

along their walk (See Survey Site 5, SE #1, SE #2). Volunteers also reported sediment loading and extensive stream bank widening along drainage areas for the Annapolis Plaza (See Survey Site 6, SE #1) and West Street (See Survey Site 8, SE #1).

RECOMMENDATIONS FOR FOLLOW-UP

This report represents the latest in a variety of studies that have occurred in the Weems Creek Watershed during the past several years. Some of these reports listed potential problems and/or recommendations for citizen/government action. Two of the more recent studies are the March 27, 1992 Weems Creek Restoration Study, prepared by Biohabitats, Inc. of Towson, and the May 11, 1991 Severn River Stream Survey, prepared by Maryland Save Our Streams, Westinghouse, Anne Arundel County, and the Maryland Department of Natural Resources.

If a current meeting group (consisting of State, County, City of Annapolis, and community representatives) does not exist, it is strongly recommended that such a group review and update the findings of these previous reports to determine what actions have been completed, are in progress, have not gone forward, or have been found to be unnecessary or cost prohibitive.

In this section, some overlap will exist in that some of the findings and concerns raised by SOS volunteers during the survey reflect upon problems and recommendations that have been raised in previous reports. It is possible that some of these issues and concerns are being addressed. With that in mind, the following recommendations are presented for consideration by government, the local community, and other interested parties:

1) **TARGETING SURVEY SITE 8 (TRIBUTARY TO WEST STREET DRAINAGE) FOR A COMPREHENSIVE ACTION PLAN**

Of the potential pollution problems volunteers were asked to identify, this short section of stream contained some of the most serious examples found throughout the watershed. Stormwater drainage from West Street appeared to be the main cause of severe bank erosion in the upper reaches of this section. Two pipe outfalls emanating from Hudson Street, emptied directly into the stream system and raised concern. One of the pipes came from a concrete plant. The other, further upstream, had dry weather flow and a reported unusual stream condition which was described as being "cloudy white, leaving a sudsy residue and causing a dark gray layer on the soil". One of the most significant trash areas reported during the survey was at the head of this stream section.

Because of the nature and scope of these potential problems, this section of stream would be a good choice for a concentrated, comprehensive restoration and protection effort. Government would need to take the lead in addressing the problems related to stormwater

management and erosion control, while citizens could organize a stream clean up and other public education or protection projects. Efforts could be made to reach out to the immediate business community. For example, because of its close proximity, The Capital newspaper could be approached about getting involved in the organization, promotion, and reporting on the progress of such a campaign.

2) EXAMINATION AND ASSESSMENT OF STREAM BANK RESTORATION

Anne Arundel County is currently working with an environmental consultant to conduct a stream restoration project along the upper portion of Cowhide Branch (Site 5), in order to control erosion, reduce sediment loading, and create a more natural habitat. If it has not yet been done, other sections of the creek reported to be suffering from severe erosion and sediment loading, should be assessed by the County, the City of Annapolis, and appropriate consultants, for similar restoration work. Along with section 8 (mentioned in recommendation #1) the upper reaches of section 6 should be given high priority for review and assessment.

Sites to also be considered for such assessment are the two Admiral Heights Drainage Areas (Site 9 and Site 10). Both sites reported severe erosion in the upper reaches.

3) BUILD CITIZEN/BUSINESS PARTNERSHIPS IN STREAM PROTECTION EFFORTS

Because of the mix of residential and commercial property in the Weems Creek watershed, there is a need to build a stronger sense of "community" between those two interests. A good place to begin would be the Annapolis Mall. Two businesses in or near the Mall have participated in past SOS activities (including this stream survey). Citizens and business leaders should work to expand such contacts and involvement. Businesses will benefit through the promotion of their community service efforts and employee involvement programs. Weems Creek will benefit from successfully completed projects. Matching business people and homeowners in joint projects can also help to build bridges of mutual understanding and dialogue, as future decisions affecting land use or water quality are considered.

Two large-scale clean up projects are possibilities for such an initiative. A clean up near West Street, along Site 8, was mentioned previously. If the recommendations mentioned in item 1 are not fully addressed, the clean up project should still move forward.

Another large-scale clean up project could be organized on Site 6, behind Annapolis Plaza. Additionally, other project opportunities, such as storm drain stencilling and/or a tree planting (perhaps at the location identified in Survey Site 2) could be pursued.

An eventual goal of this effort should be the creation of a Citizen/Business Adopt-A-Stream Committee, which would meet on a regular basis to organize ongoing stream restoration and/or education projects.

4) GOVERNMENT INVESTIGATION OF ILLEGAL DUMPING

The watershed contains a number of large scale "dumps". The two outlined in the previous recommendation are the most accessible and viable for citizen clean up. However, others will prove to be more difficult, because of their more isolated nature. It is recommended that the County and or City government review the reports contained in this survey of large isolated dumps, and determine if any action can be brought against any responsible, identifiable parties. Along with the trash dumping areas cited in recommendation 3, it is further recommended that investigations be conducted on:

Survey Site 1 -- TD #1
Survey Site 3 -- TD #1, #2, #3
Survey Site 5 -- TD #2
Survey Site 7 -- TD #1, #2, #3
Survey Site 10 - TD #1

5) REVIEW OF REPORTED FISH MIGRATION BARRIER AREA

The section of Cowhide Branch near the Route 50 bridge and Admiral Drive should be reviewed for reported fish barriers.

6) COMMUNITY/GOVERNMENT CONSTRUCTION SITE MONITORING WORKSHOP

Much of the concern among watershed residents centers around sedimentation into the main stem of Weems Creek. While several large scale construction projects are at or near completion, future construction can and should be anticipated. If it does not already exist, it is recommended that the community work with the State, County, and City to establish an effective plan of action whereby trained volunteers can assist government in certifying and enforcing sediment and erosion control regulations. For example, arrangements can be made between government inspectors and trained volunteers to conduct regular joint reviews of construction sites that are of particular concern.

It is further recommended that a part of this process include the planning and organizing of a workshop where citizens can be trained in how to become construction site monitors. With enough advance planning, such a workshop can increase the number of citizens willing to play a role in the protection of the watershed.

7) MISCELLANEOUS

The following miscellaneous items should be considered for immediate review and, if necessary, action:

Survey Site 1 -- PO #3: This drainage pipe, reportedly for a house roof and land area, should be reviewed to ensure there are no resulting problems.

Survey Site 2 -- ER #1: This area, described as a "sinkhole" next to the highway and a drainage pipe (PO #4) should be examined for possible repair.

Survey Site 2 -- A downed silt barrier in Swan Cove should either be repaired or removed.

Survey Site 4 -- PO #3: A series of PVC pipes which volunteers believed to be coming from a swimming pool at a residential complex, should be investigated.

Survey Site 5 -- PO #4: A metal pipe near Gate Drive, which was reportedly discharging during the day of the survey, should be investigated. At the time, volunteers described water as being "soapy". They also detected a chlorine odor.

Survey Site 7 -- PO #2, TD #2: Volunteers believed trash in this area was a direct result of the pipe outfall. They recommended the placement of a grate to catch trash before entering the stream system.

Survey Site 9 -- ER #2: Repairs should be considered for a "pothole", approximately six feet in diameter and five feet deep. This was reported at the point where drainage from PO #2 enters the stream system.