

# THE USE OF BENTHIC MACROINVERTEBRATE ASSESSMENTS IN THE STRESSOR IDENTIFICATION PROCESS TO REDUCE CHEMICAL ANALYTICAL COSTS (SESSION J-2)



PRESENTED BY WILLIAM HONACHEFSKY, P.L.S.,P.P

NJDEP WATER MONITORING AND STANDARDS

# WHY STRESSOR IDENTIFICATION?

- STATE AND FEDERAL CLEAN WATER ACT LEGISLATION REQUIRES STATES TO IDENTIFY WHAT IS CAUSING IMPAIRMENT OF THEIR WATERBODIES.
- WHILE INITIAL FOCUS WAS ON CHEMICAL RELATED IMPAIRMENTS, BIOLOGICAL IMPAIRMENTS HAVE BECOME EQUALLY AS IMPORTANT. IN NEW JERSEY THIS HAS BEEN MEASURED PRIMARILY BY THE HEALTH OF BENTHIC MACROINVERTEBRATE POPULATIONS.
- REMEDIATING IMPAIRED WATERBODIES REQUIRES THAT THE CAUSES OF IMPAIRMENT FIRST BE IDENTIFIED – AN OFTEN DIFFICULT UNDERTAKING, ESPECIALLY WHEN THE SOURCES OF IMPAIRMENT ARE NOT SOLELY THE RESULT OF PIPED DISCHARGES.



## SEARCHING FOR THE CULPRIT(S)

IT IS OFTEN IMPOSSIBLE TO ENUMERATE EVERY POTENTIAL STRESSOR OF A CONTRIBUTING WATERSHED BECAUSE OF “MASKING” DEFINED BY HONACHEFSKY (2008) AS;

*“ THE ACCUMULATION OF ENVIRONMENTAL STRESSORS IN SUCH LARGE NUMBERS, FROM SO MANY SOURCES SIMULTANEOUSLY, THAT INDIVIDUAL STRESSORS CANNOT BE TEASED OUT”.*

BIOLOGICAL (BENTHIC MACROINVERTEBRATE) SAMPLING HELPS US PINPOINT SOME OF THE BEST AND WORST AREAS.



# LET'S LOOK AT THE BEAVER BROOK WATERSHED



**EXCESSIVE NUTRIENTS?**





# THE GOLF COURSE?



# RESEARCH FACILITY DISCHARGE?

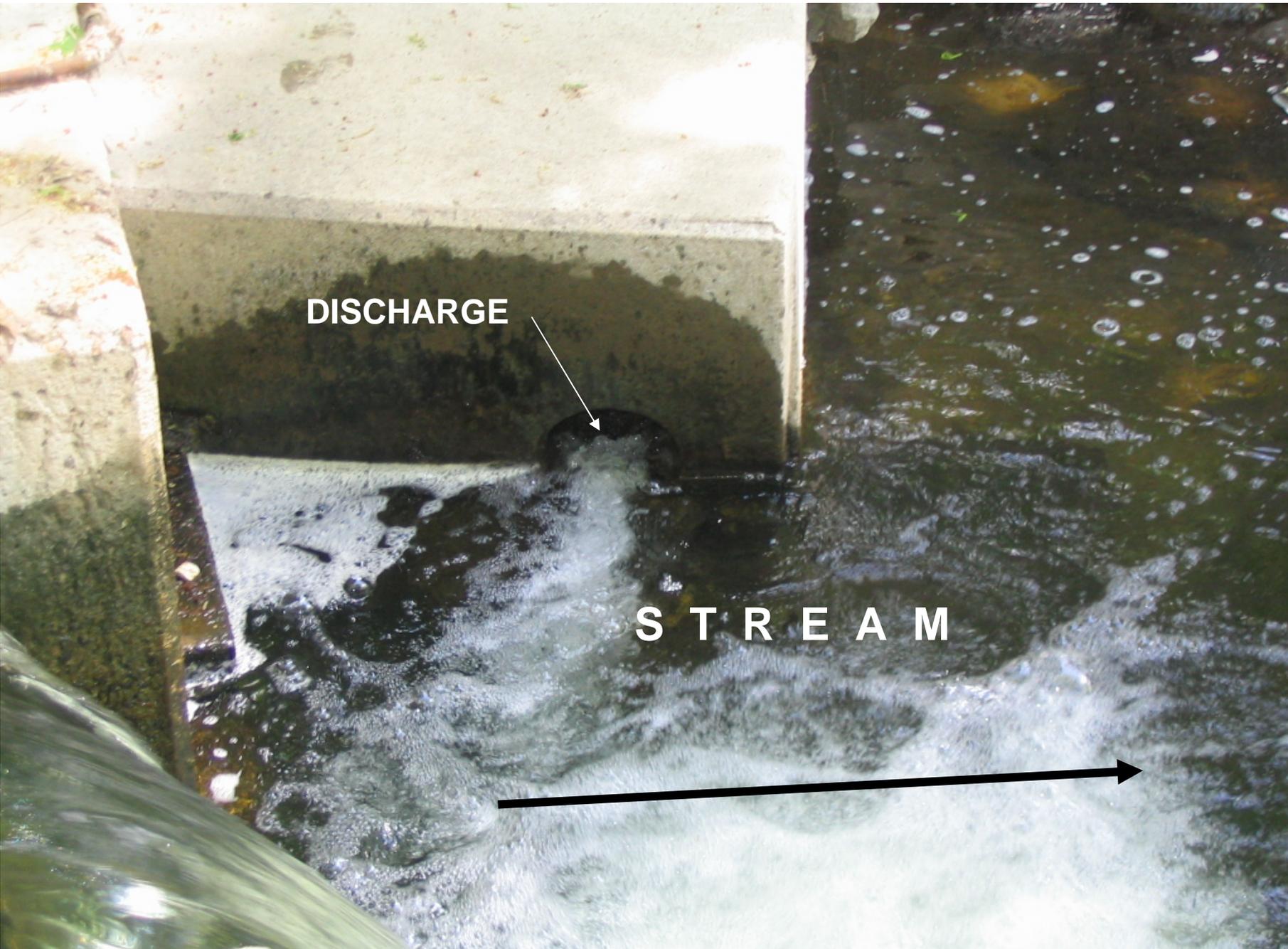
DISCHARGE ORIGIN:  
EXXON RESEARCH & ENGINEERING CO.

NJPDES PERMIT NUMBER: NJ0035084

DISCHARGE SERIAL NUMBER: DSN001

NJDEP HOTLINE NUMBER: (609) 292-7172





**DISCHARGE**

**S T R E A M**





**EXCESSIVE EROSION?**





**CALCIUM CHLORIDE SPILLAGE FROM  
AN NJDOT FACILITY?**





**SOAPY WATER RUNOFF FROM THE CAR WASH?**





**RUNOFF FROM FIREFIGHTING  
TRAINING FACILITY?**



PERMITTED DISCHARGE FROM A  
CORRECTIONAL FACILITY?





UNFENCED COW PASTURES?





**DETENTION BASIN  
DISCHARGES?**





UNCONTROLLED STORMWATER  
DISCHARGES?





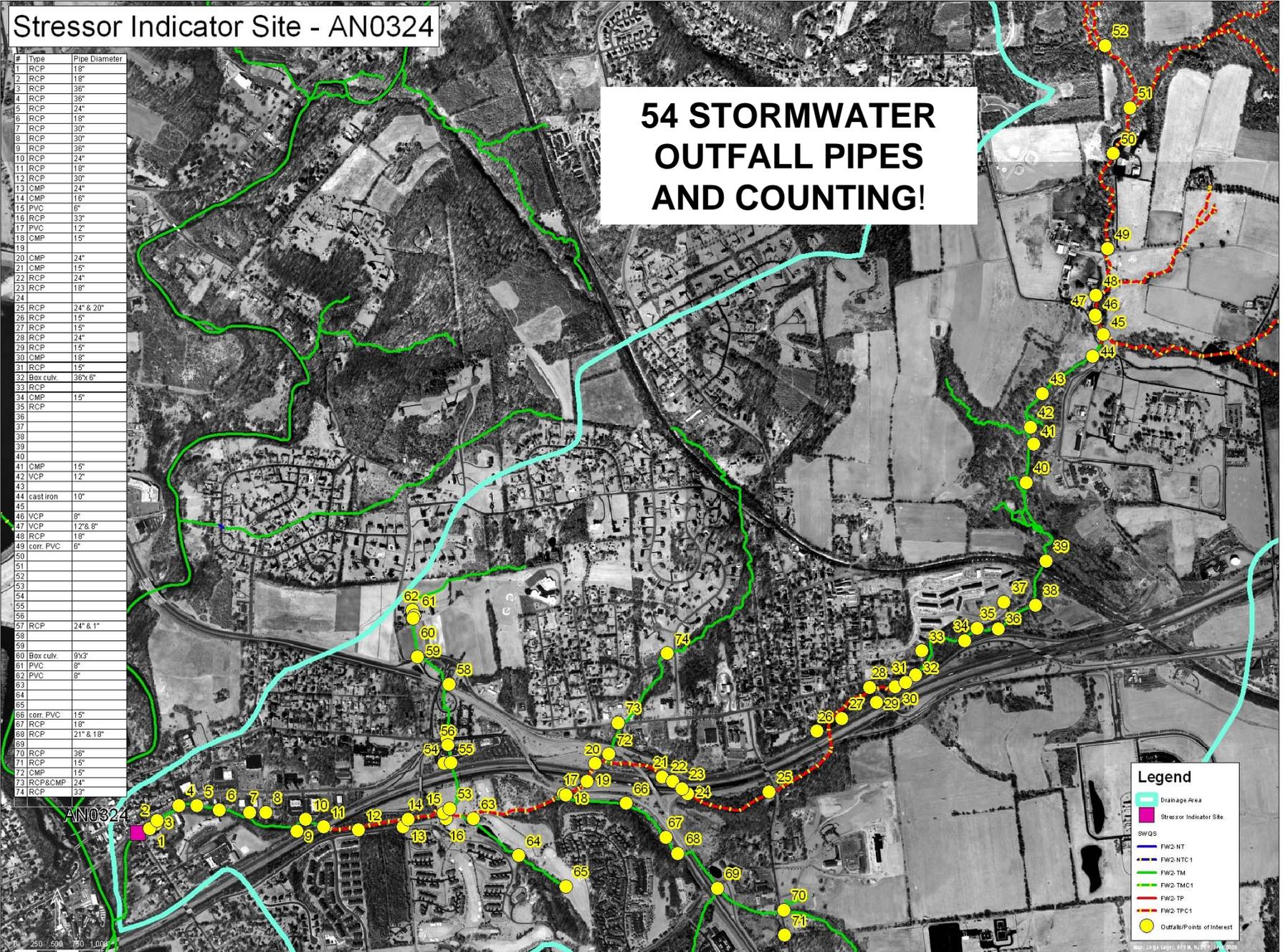




# Stressor Indicator Site - AN0324

**54 STORMWATER  
OUTFALL PIPES  
AND COUNTING!**

#	Type	Pipe Diameter
1	RCP	18"
2	RCP	18"
3	RCP	36"
4	RCP	36"
5	RCP	24"
6	RCP	18"
7	RCP	30"
8	RCP	30"
9	RCP	36"
10	RCP	24"
11	RCP	18"
12	RCP	30"
13	CMP	24"
14	CMP	16"
15	PVC	6"
16	RCP	33"
17	PVC	12"
18	CMP	15"
19		
20	CMP	24"
21	CMP	15"
22	RCP	24"
23	RCP	18"
24		
25	RCP	24" & 20"
26	RCP	15"
27	RCP	15"
28	RCP	24"
29	RCP	15"
30	CMP	18"
31	RCP	15"
32	Box cul.	36"x6"
33	RCP	
34	CMP	15"
35	RCP	
36		
37		
38		
39		
40		
41	CMP	15"
42	VCP	12"
43		
44	cast iron	10"
45		
46	VCP	8"
47	VCP	12" & 8"
48	RCP	18"
49	corr. PVC	6"
50		
51		
52		
53		
54		
55		
56		
57	RCP	24" & 1"
58		
59		
60	Box cul.	9x3"
61	PVC	8"
62	PVC	8"
63		
64		
65		
66	corr. PVC	15"
67	RCP	18"
68	RCP	21" & 18"
69		
70	RCP	36"
71	RCP	15"
72	CMP	15"
73	RCP&CMP	24"
74	RCP	33"



**Legend**

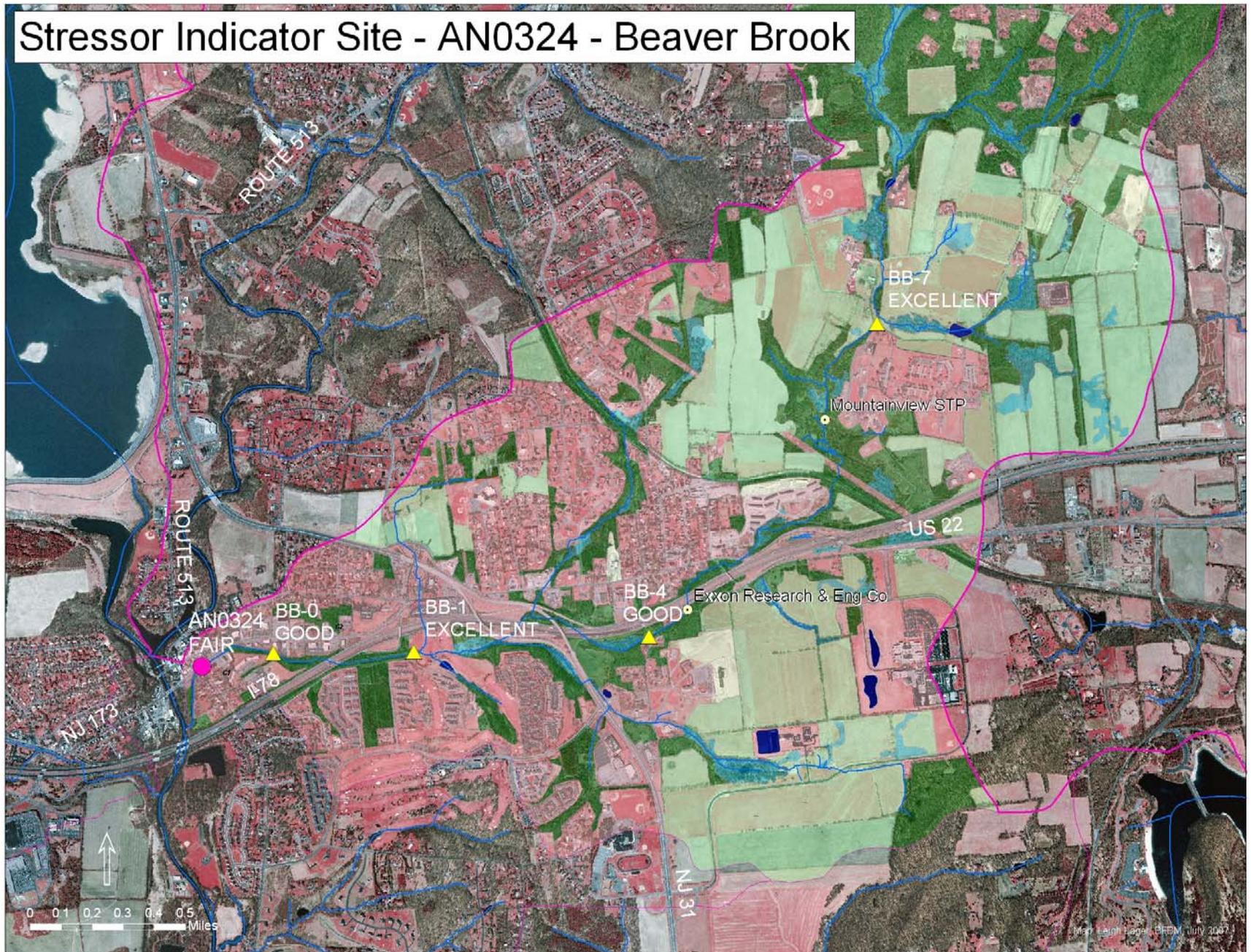
- Drainage Area
- Stressor Indicator Site
- SWGS
- FW2-NT
- FW2-NTC1
- FW2-TM
- FW2-TMC1
- FW2-TP
- FW2-TFC1
- Outfalls/Points of Interest

# NARROWING THE SCOPE OF THE INVESTIGATION

- DETERMINE HOW FAR UPSTREAM THE IMPAIRMENT OCCURS WITH THE
- USE OF LESS COSTLY BIOLOGICAL (BENTHIC MACROINVERTEBRATE) ASSESSMENTS.
- ELIMINATE THOSE REACHES AND/OR TRIBUTARIES THAT REFLECT GOOD OR EXCELLENT CONDITIONS.



# Stressor Indicator Site - AN0324 - Beaver Brook



# ESTIMATED SAVINGS IN CHEMICAL ANALYTICAL COSTS

- AT THIS ONE SITE - ABOUT \$7,500

