

AGENDA
BOARD OF SELECTMEN
Community Center, 32 Lechner Street
April 19, 2010

9:00 AM - SPECIAL MEETING

- I. Public Works Informational Meeting -- Operation of the Rapid Infiltration Basins**
- A. Introduction
 - B. Background: study, permits, construction, operation
 - C. Time line of unexpected issues
 - D. Data
 - E. Discussion / Questions

II. Adjournment

If there is anyone with a disability needing any modifications and/or auxiliary aid to access this meeting, please notify the Planning & Development Department at 569-8161 at least 24 hours prior to the meeting date.

Wolfeboro Effluent Disposal Timeline

<u>DATE</u>	<u>EVENT</u>
March 2006	Wolfeboro Town Meeting Approves \$1.77 Mil
March 2007	Wright-Pierce Phase 3 Hydro Report (basis for Permit
July 11, 2007	NHDES issues Ground Water Discharge Permit for Whitten Site
March, 2008	Begin Construction of RIB, Pump Station and Pipeline
March 3, 2009	Begin Operation of Rapid Infiltration Basins
April 23, 2009	Observed Slope Failure above Central Wetland Area
Apr-June, 2009	Town modifies operation, collects additional data
June 8, 2009	Observed sink hole and sand piping
August 12, 2009	Town submits Response and Action Plan to NHDES
August 26, 2009	Meeting with Town, Consultants and NHDES to review Action Plan
	NHDES requires construction of additional basins
Fall 2009	Additional Geotech work, design of new RIBs
Jan 2010	Begin Construction of RIBs 4 & 5
April 2010	RIBs 4 & 5 Substantially Complete

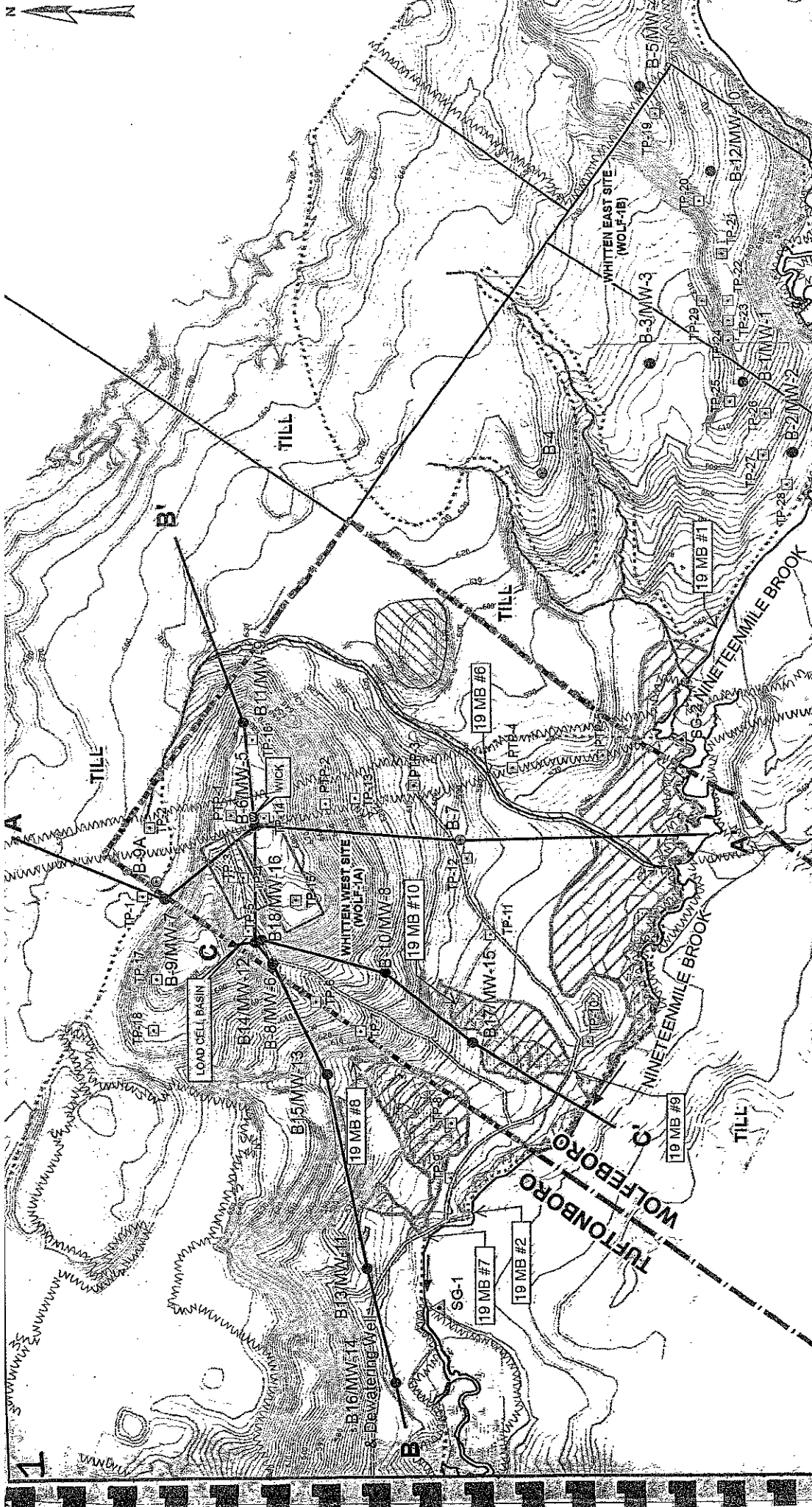
Wolfeboro Public Works Informational Meeting

Monday, April 19, 2010

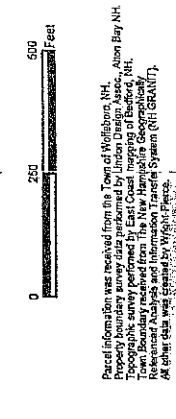
Operation of Rapid Infiltration Basin (RIB)

Data Handouts

- 1 Site Plan**
- 2 RIB Permit Groundwater Monitoring Well Data Summary**
- 3 RIB Site Surface Water Quality Data Summary**
- 4 Monitoring Well (MW) Water Level vs. Discharge**
- 5 Nineteen Mile Brook - Stream Gauging and Watershed Map**
- 6 Estimated Flow from RIB**
- 7 Measured flow from RIB**
- 8 Operations Plan- RIB Flow vs. ESP Volume**



RIB SITE PLAN SURFACE
WATER SAMPLE POINTS
WOLFBORO, NH



Parcel information was received from the Town of Wolfboro, NH.
Property boundary survey data performed by J. David Assoc., Alloway Bay, NH.
Topographic survey performed by J. David Assoc., Alloway Bay, NH.
Geological survey performed by J. David Assoc., Alloway Bay, NH.
Relevant Analysis and Information Transfer System (RII) GRANTY.
All other data was obtained by Wright Pierce, Inc.

PROJ: A
DATE: AUG 09
SCALE: AS SHOWN

FIGURE 1

- MONITORING WELL
- TEST BORING
- TEST PIT
- STAFF GAUGE
- WICK
- WETLAND
- MODIFIED RIB AREA
- STRATIFIED DRIFT
- PROPOSED SUBDIVISION LINE
- EXPOSED BEDROCK
- EXISTING GROUNDWATER DISCHARGE AREA
- LINE OF GEOLOGIC CROSS SECTION
- TOWN BOUNDARY
- PROPERTY BOUNDARY
- PARCEL
- TREE LINE
- INTERMITTENT STREAM

Wolfeboro Effluent Disposal System

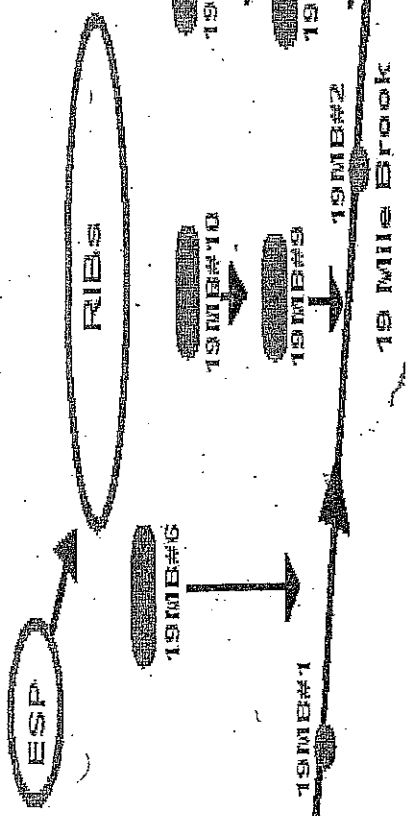
RIB Permit Monitoring Well Data

Monitoring Well	Nitrate/Nitrite (mg/l)		Total Phosphorus (mg/l)		Chloride (mg/l)		Sp. Conductance (uS/cm)														
	06/14/08	11/05/08	05/13/09	11/18/09	02/10/10	05/14/08	11/05/08	05/13/09	11/18/09	02/10/10											
MW-1	<.5	0.12	<.05	0.13	<.05	0.06	0.02	0.14	<.002	0.1	1	1	1	2	<1	NT	34	26	34	23	
MW-2	<.5	<.05	<.5	0.71	1	0.03	0.02	0.13	<.002	0.083	1	1	1	2	96	94	NT	26	39	360	380
MW-5	<.5	NT	1.2	1.9	1.9	0.04	NT	0.05	0.012	0.06	2	NT	100	84	70	NT	530	430	380	380	
MW-8	<.5	0.19	1.4	1	2	0.04	0.04	0.03	0.008	0.032	2	1	98	90	84	NT	41	460	390	380	
MW-15	<.5	0.19	<.5	1.6	1.2	0.04	0.04	0.32	0.01	0.045	1	1	2	95	86	NT	44	49	400	380	
MW-19	NT	NT	1.8	NT	2.2	NT	NT	<.05	NT	0.03	NT	NT	NT	NT	89	NT	NT	NT	NT	470	
Effluent to RIB	NT	NT	NT	3.6	2.9	NT	NT	NT	0.76	0.6	NT	NT	NT	87	93	NT	NT	NT	460	490	

Note: NT=Not Tested

Waterford RIB
Water Quality Data Summary

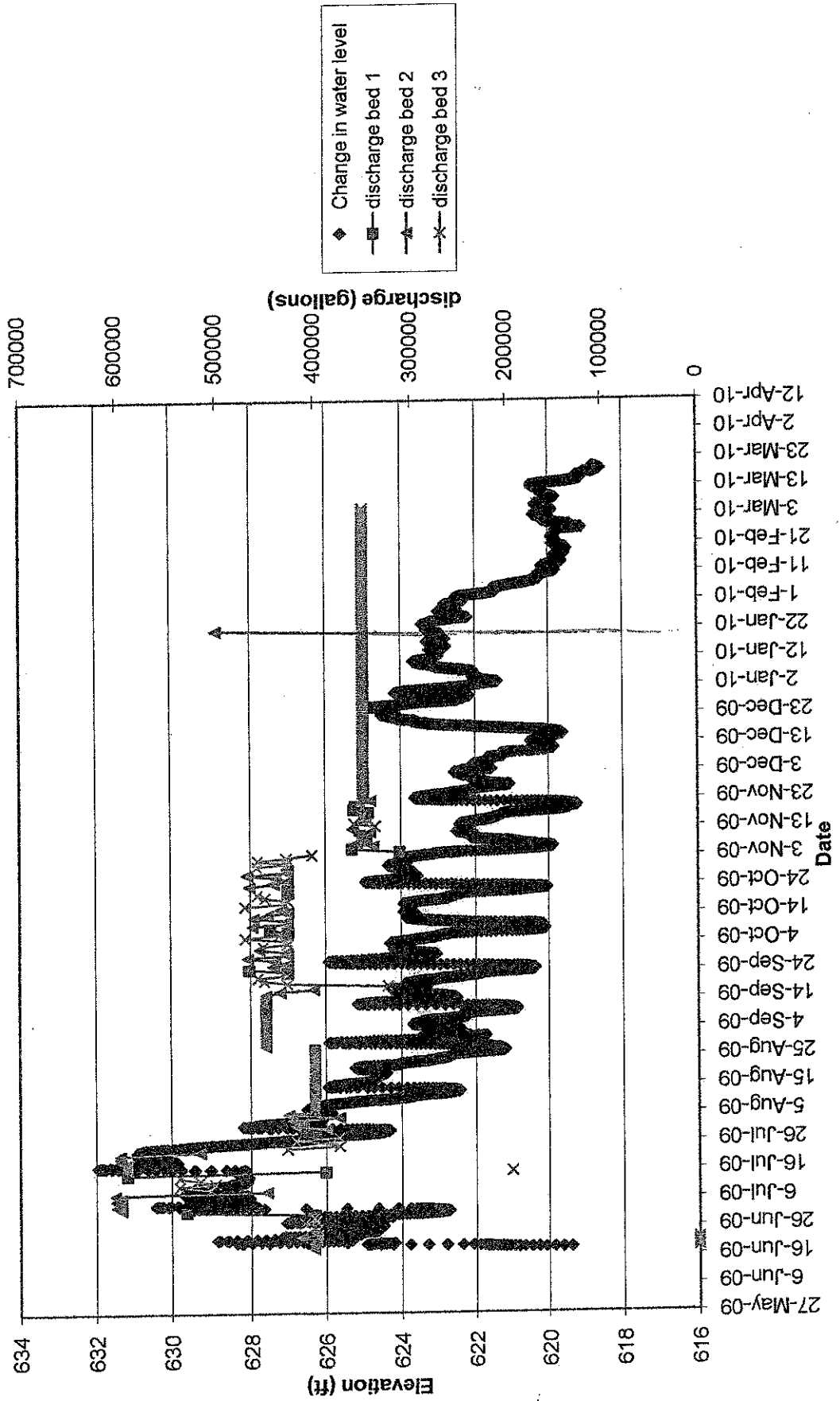
4/10/10



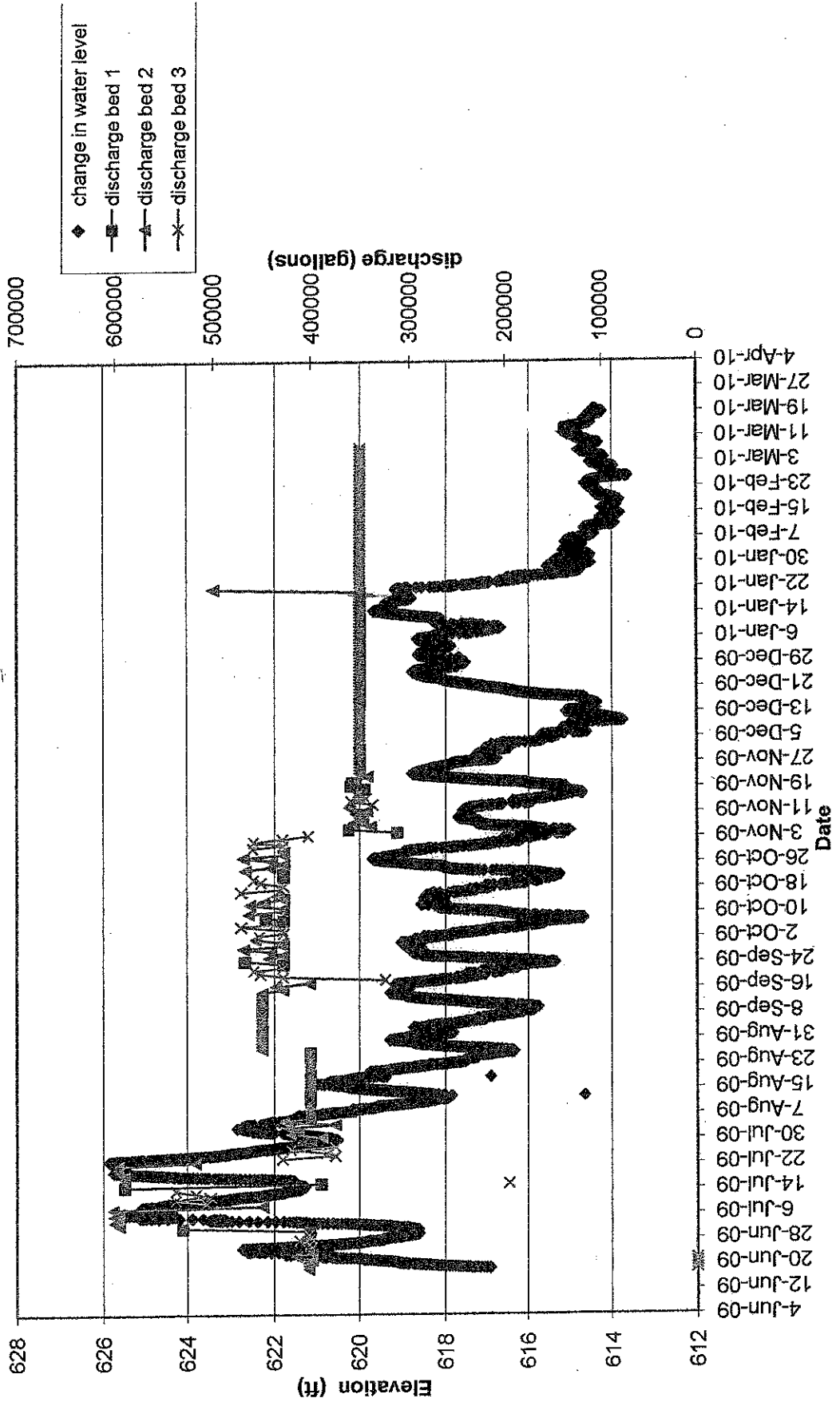
Date	Nitrate/Nitrite (mg/l)		Total Phosphorus (mg/l)		Chloride (mg/l)		Sp. Conductance (uS/cm)													
	05/15/08	02/05/09	08/10/09	11/17/09	03/11/10	05/15/09	09/10/09	11/17/09												
ESP	4.9	3.1	1.46	3.5	1.76	0.8	1.7	0.69	0.13	0.24	NT	NT	NT	NT	NT	NT	NT	NT		
RIB	NT	NT	1.7	3.6	3.1	NT	NT	0.75	0.76	0.49	NT	NT	89	97	84	NT	NT	460	460	
Soil Mass																				
Surface Water Sample Points																				
6	<0.05	0.07	0.86	0.26	0.11	0.05	0.06	0.02	0.007	0.005	1	1	63	18	6	30	24	260	89	110
11	NT	NT	0.31	0.69	0.79	NT	NT	0.016	0.017	<0.004	NT	NT	90	96	72	NT	NT	440	400	310
10	NT	NT	1	0.69	1.9	NT	NT	0.009	0.01	<0.004	NT	NT	110	83	83	NT	NT	430	460	390
8	NT	NT	0.58	0.7	1.8	NT	NT	0.038	0.037	0.005	NT	NT	109	92	88	NT	NT	420	410	400
6	NT	NT	0.66	0.61	1.8	NT	NT	0.014	0.014	0.015	NT	NT	100	89	84	NT	NT	410	390	390
7	NT	NT	0.47	0.46	1	NT	NT	0.018	0.01	0.009	NT	NT	83	76	68	NT	NT	340	310	300
19 Mile Brook Sample Points																				
1	<0.05	0.09	0.07	0.08	0.07	0.09	0.04	0.045	0.01	<0.05	3	3	6 ⁺	5	4	31	39	43	39	35
2	0.05	0.07	0.18	0.12	0.09	0.04	0.05	0.023	0.011	0.016	3	3	23	12	7	NT	38	120	67	49
3	<0.05	0.09	0.07	0.07	NT	0.06	0.07	0.025	0.012	NT	3	3	26	14	NT	41	41	130	78	117
4	0.05	0.09	0.12	0.15	0.1	0.05	0.07	0.006	0.013	0.018	4	3	25	11	6	42	40	69	74	54
5	<0.05	<0.05	0.11	0.05	0.11	0.05	0.02	0.027	0.02	0.009	5	5	16	8	7	30	42	82	62	50

Note: NT=Not Tested

MW-19A Water Level vs Discharge

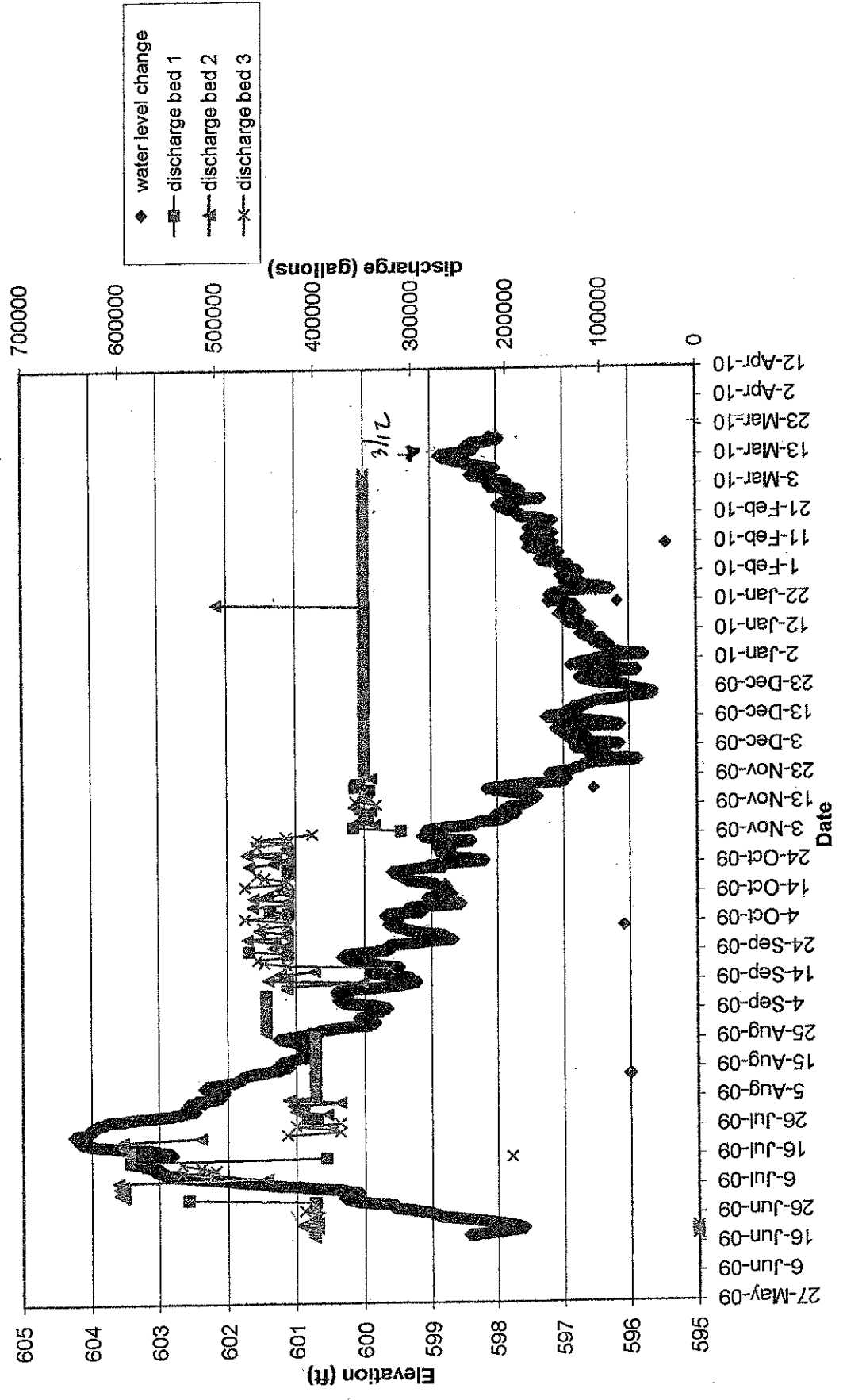


MW-16B Water level vs Discharge

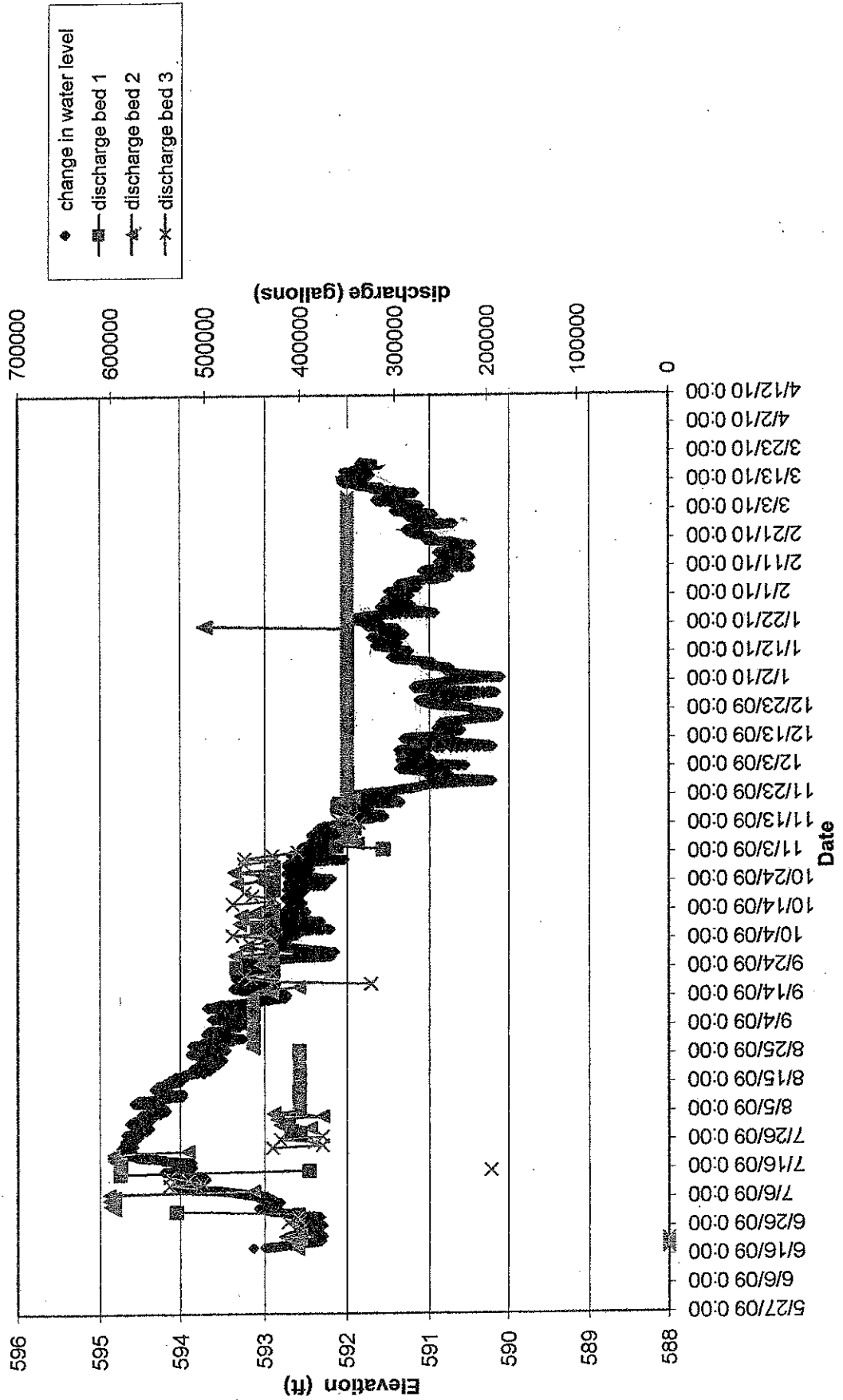


3/23/10

MW-8 Water Level vs Discharge



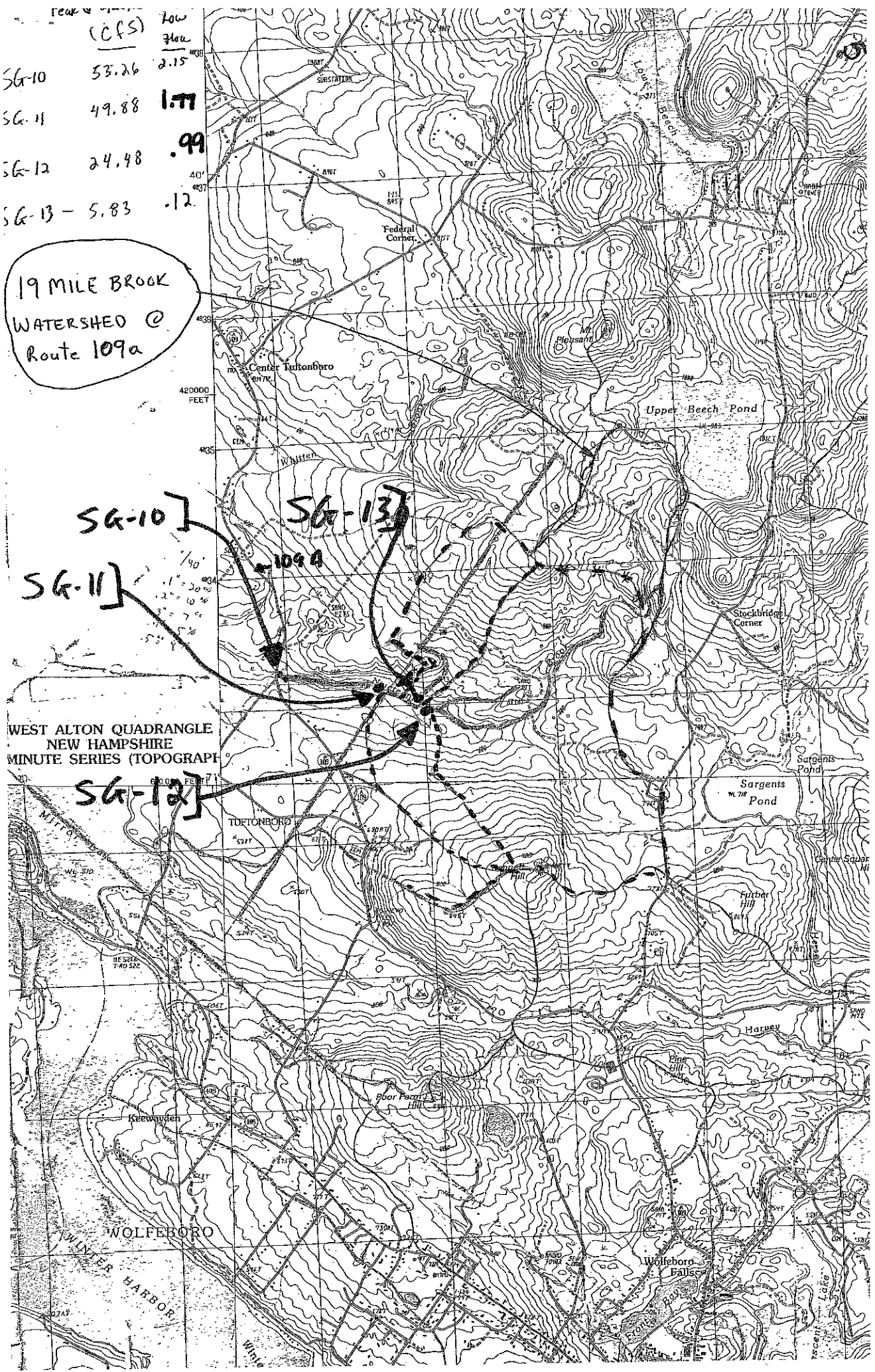
MW-13 Water level vs Discharge



Nineteen Mile Brook - Stream Gauging									
Date	RT 109A Bridge (SG-10)		NMB Downstream (SG-11)		NMB Upstream (SG-12)		NMB Unnamed Tributary (SG-13)		Flow (cfs)
	Staff Gauge Reading	Flow (cfs)	Staff Gauge Reading	Flow (cfs)	Staff Gauge Reading	Flow (cfs)	Staff Gauge Reading	Flow (cfs)	
6/4/2009	0.98	3.24	0.98	2.68	1.24	1.74	NMS	0.15	
6/25/2009	1.12	5.71	1.2	4.83	1.53	3.31	1.18	0.39	
7/21/2009	0.98	2.88	1.01	2.59	1.35	1.55	1.07	0.11	
9/11/2009	0.91	2.15	0.99	1.77	1.23	0.99	1	0.12	
11/18/2009	1.04	3.66	1.15	3.35	1.57	2.21	1.14	0.3	
12/18/2009	1.02	3.76	1.1	3.32					
2/26/2010	2.98	53.26	3.14	49.88	3.4	35.36	2.44	5.83	

	Peak	(CFS)	Flow
SG-10	53.26	2.15	
SG-11	49.88	1.77	
SG-12	24.48	.99	
SG-13	5.83	.12	

19 MILE BROOK
WATERSHED @
Route 109a



WEST ALTON QUADRANGLE
NEW HAMPSHIRE
MINUTE SERIES (TOPOGRAPHIC)

SG-12

SG-10

SG-13

SG-11

109a

WOLFBORO

WINTER HARBOR

Wolfboro Falls

Sargents Pond

Upper Beech Pond

TUFFONBORO

Poor Farm Hill

Harney

Furber Hill

Center Square

Sargents Pond

Stockbridge Corner

Mount Pleasant

Federal Corner

Center Tuffonboro

Whittier

42000 FEET

40' 437

4030

Estimated Flow from RIB based on W-P Phase 3 Hydro Report March 2007

Model	Ambient Conditions	Based on 600,000/GPD	% of Total	Assume 350,000	GPM	CFS	Assume 250,000	GPM	CFS
Surface Water Body	89,000	166,000	24%	105,768	73	0.16	81,675	57	0.13
19 mile brook	3,000	181,000	26%	115,325	80	0.18	89,055	62	0.14
Unnamed Brook		208,000	30%	132,528	92	0.21	102,340	71	0.16
Western Wet		60,000	9%	38,229	27	0.06	29,521	21	0.05
Central Wet	3,000	74,000	11%	47,149	33	0.07	36,409	25	0.06
Eastern Wet	95,000	689,000		439,000	305		339,000	235	
RIB Flow									
GPD									
GPM									
CFS									
600,000	417					0.93			
500,000	347					0.77			
450,000	313					0.70			
350,000	243					0.54			
250,000	174					0.39			

Wolfeboro RIB Site

Flow Measurements in Central and Western Wetland Areas

4/16/2010

Date	Weir 1 Flow (GPM)	Weir 2 Flow (GPM)	Weir 3 Flow (GPM)	Weir 4 Flow (GPM)	Weir 5 Flow (GPM)	Weir 6 Flow (GPM)	Weir 7 Flow (GPM)
3/4/2010	36	5	4				
3/5/2010	36	5	5				
3/9/2010	34	5	5	24	41		
3/11/2010	36	5	5	24	41	84	80
3/12/2010	37	5	5	25	41	70	80
3/15/2010	54	6	8	31	45	121	149
3/16/2010	41	5	6	29	46	74	86
3/17/2010	41	5	6	29	46	66	86
3/19/2010	38	5	5	30	43	74	86
3/22/2010	41	4	5	28	43	59	84
3/23/2010	47	6	7	30	48	100	121
3/24/2010	36	5	5	27	43	NT	86
3/29/2010						100 +/- ?	121
3/30/2010	41	4	5	27	46	NT	121
3/31/2010	32	4	5	26	38	NT	91
4/5/2010	26	4	4	26	41	32	78
4/7/2010	27	4	4	26	41	32	78
4/9/2010	26	4	4	28	46	66	91
4/13/2010	27	4	5	28	44	62	82
4/16/2010	34	6	6	30	51	96	115

27-Mar-10		Updated RIB Flow vs. ESP Volume		Increase both by rainfall, estimated at 50,000 gpd based on 44 inches of rain per year directly to ESP		End of Month		
Month	Monthly Ave 2009 actual flow to RIB site	Monthly Ave 2010 assumed RIB Flow	Difference per Month	Assumed WWTP Ave. Flow Month	Monthly Ave 2009 actual flow Eff to ESP	Days per Month	Assumed Total Flow	ESP Pond Volume
Feb		350	0	350	269	28	9,800	38,000
Mar	592	290	-14260	750	469	31	23,250	52,260
Apr	278	300	-9000	600	552	30	18,000	61,260
May	253	400	-2325	475	431	31	14,725	63,585
June	308	500	750	475	513	30	14,250	62,835
July	512	500	3100	400	590	31	12,400	59,735
Aug	374	550	4650	400	440	31	12,400	55,085
Sept	433	550	4500	400	301	30	12,000	50,585
Oct	443	500	3100	400	319	31	12,400	47,485
Nov	350	500	3000	400	356	30	12,000	44,485
Dec	350	500	3100	400	326	31	12,400	41,385
Jan	350	425	2325	350		31	10,850	39,060
						365	164,475	39,060
	4243	385.7	-1060					
WWTP effluent flow year	Yearly Flow	WWTP Effluent to ESR				451	Assumed Ave. Flow for yr	Yearly Flow To ESP includes Rainfall at 44 inches/year 3.67 ft/yr
2009	138,807,529	146,487,505						
2008	144,840,194	153,200,678						
2007	123,425,286	129,696,000					Year Volume (gallons)	Ave. Daily Q (gpd)
							17,330,911	47,482
	407,073,009	429,384,183						
3 yr ave	135,691,003	143,128,061						
From J. Craigue reports		From D. Dedian						