EEP Project Closeout Summary

Project ID & Status

Project Name/Number:	Dowd Dairy
EEP ID	119
County:	Bladen
Project Type:	Wetland Restoration, Preservation
Current Status:	5 Years of Monitoring complete

Project Setting

Basin:	Cape Fear
Physiographic Region:	Coastal Plain
Ecoregion:	Southern Inner Coastal Plain
USGS Hydro Unit:	03030005

Project Performers

DOT Project Transfer in 2005

Project Timeline

Milestone	Date
Construction Completed	**1998**
Monitoring Year-1	**2001**
Monitoring Year -2	**2002**
Monitoring Year-3	**2003**
Monitoring Year-4	**2004**
Monitoring Year-5	**2005**
Monitoring Year-6	**2006**

Project Restoration Components and Mitigation Assets

Wetland		Asset Data				
	Restoration Component		Ratio Multip	Acres	WMU	Wetland Type
	Bottomland Hardwood	R	1.00	12.05	12.05	RIP
	Bottomland Hardwood	R	1.00	566.42	566.42	N RIP

Asset Summary

Level	Multip	Acres	WMU
R	1.00	578.47	578.47
E	0.50	0.00	0.00
C	0.33	0.00	0.00
P	0.20	0.00	0.00
		578.47	**578.47**

Standard Ratios

	Level	Ratio	Multiplier
Wetland	**R**	1	1.000
Wetland	**E**	2	0.500
Wetland	**C**	3	0.333
Wetland	**P**	5	0.200

Dowd Dairy is a 658 acre site in Bladen County constructed by DOT as a wetland mitigation site with 619 acres planted in bottomland hardwoods. The site is in an interstream divide that was long ago converted for agricultural use. The site discharges into Panther and Ellis Creek. Restoration activities included filling lateral ditches and adding ditch plugs and ripping the compacted pastures. Dowd Dairy Farm Phase I was constructed in 1998 with Phase II completed in 2000 with 2006 being the sixth year of monitoring.

Site monitoring involved collecting data from 31 groundwater monitoring gauges and counting stems in 38 vegetative plots. The wetland plant communities include non-riverine wet hardwood forest, 320.25 acres, , non-riverine swamp forest, 201.2 acres, headwater slope swamp, 12.05 acres, Atlantic white cedar slope, 67.76 acres with Pine, Oak Hickory forest, with a total of 578.47 acres of restored wetland accepted by the agencies at close-out. An area 17.68 acres in size has been set aside as upland habitat.

P1 = Priority I Restoration
P2 = Priority II Restoration
P3 = Priority III Restoration

R = Restoration
E = Wetland Enhancement
EI = Stream Enhancement I
EII = Stream Enhancemnt II
C = Wetland Creation
P = Preservation

SMU =Stream Mitigation Units
WMU = Wetland Mitigation Units
P/I/E = Perennial, Intermittent, Ephemeral

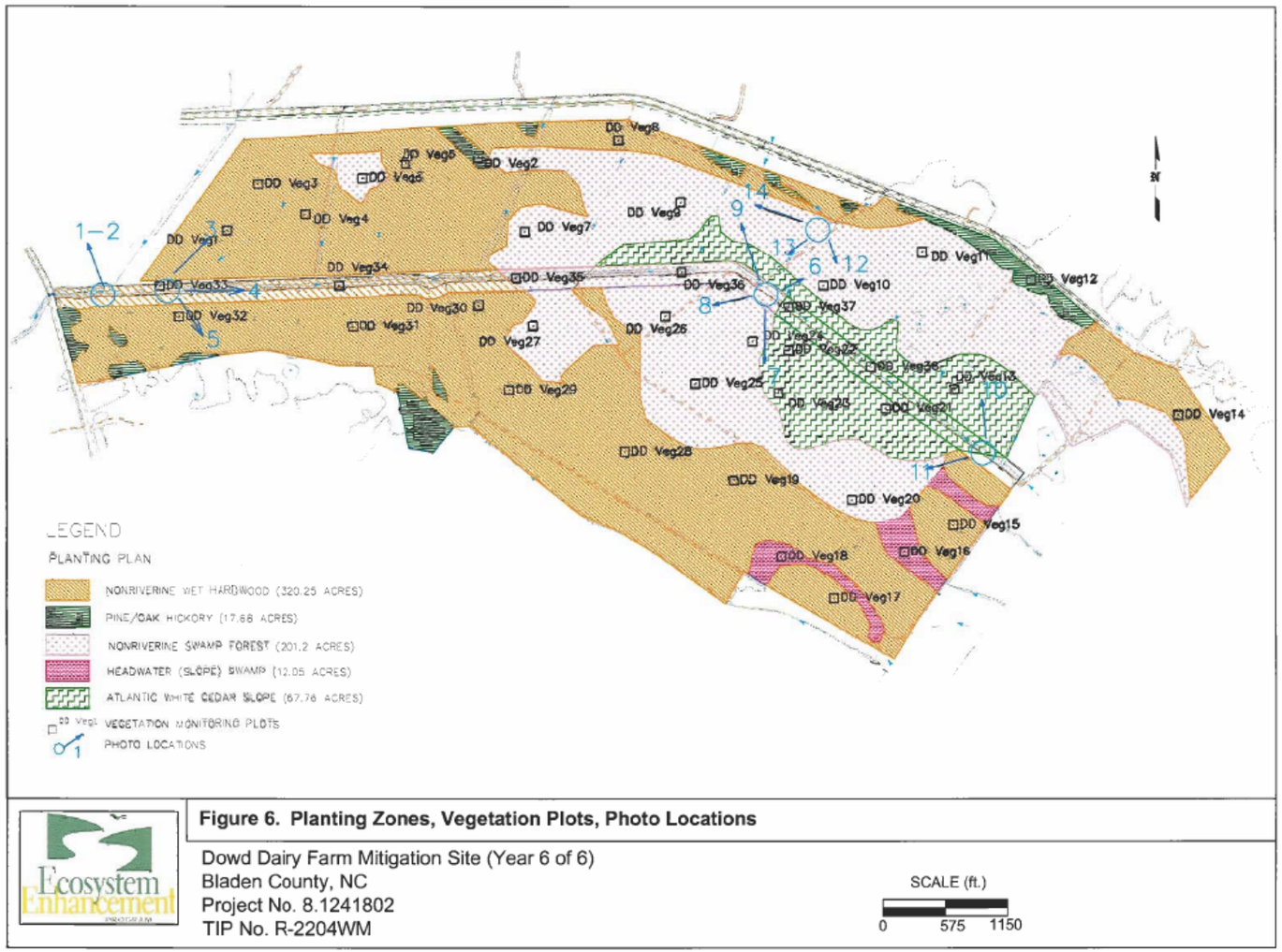

Figure 6. Planting Zones, Vegetation Plots, Photo Locations

Dowd Dairy Farm Mitigation Site (Year 6 of 6)
Bladen County, NC
Project No. 8.1241802
TIP No. R-2204WM

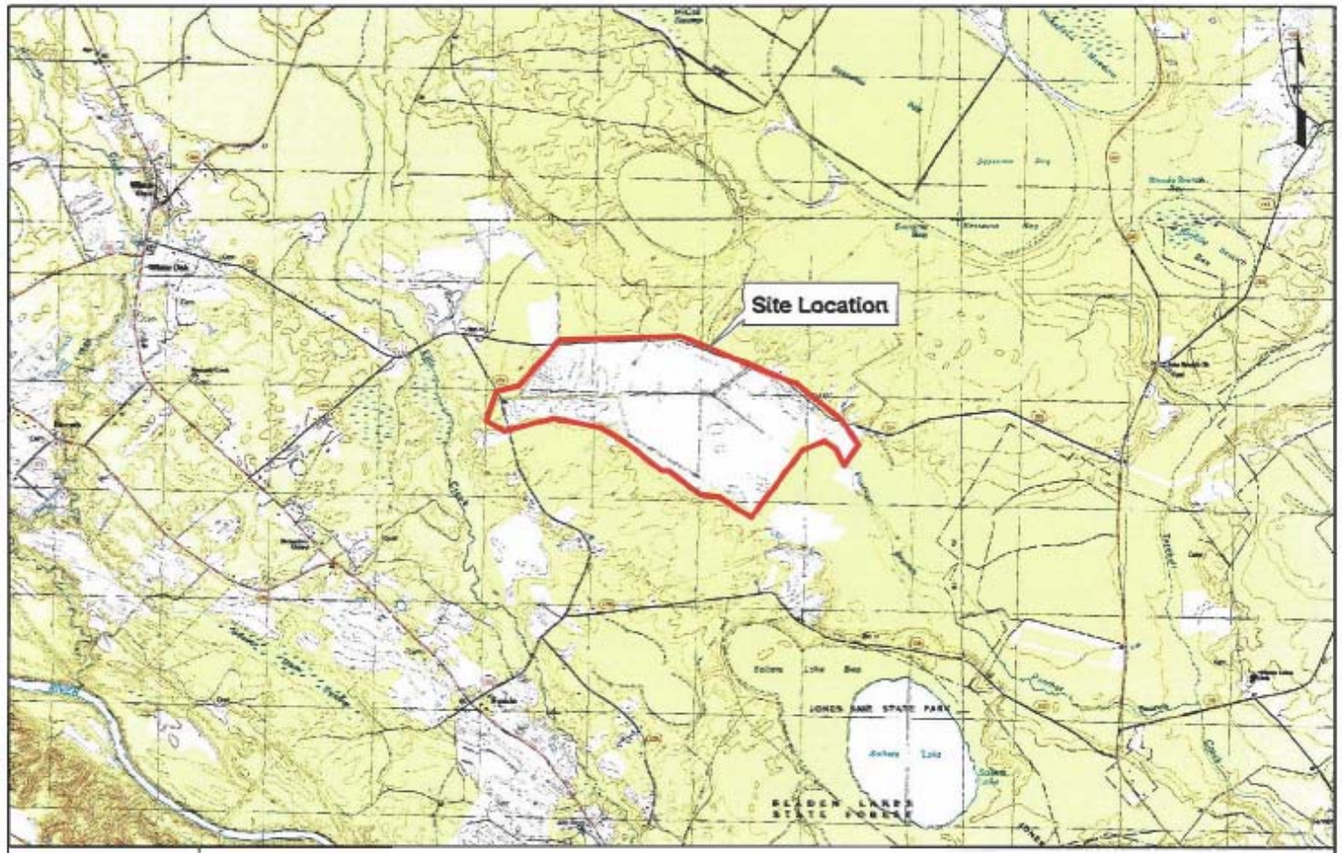

Figure 1. Site Location Map

Dowd Dairy Farm Mitigation Site (Year 6 of 6)
Bladen County, NC
Project No. 8.1241802
TIP No. R-2204WM

SCALE
4,000 2,000 0
Feet

The Louis Berger Group, Inc.
NOVEMBER 2006

Table 2
2002 HYDROLOGIC MONITORING RESULTS –
(MARCH 16 – NOVEMBER 14)

Monitoring Gauge	< 5% (<12 dy)	5 - 8% (12-19 dy)	8 – 12.5% (20-30 dy)	> 12.5% (>31 dy)	Actual %	Dates Meeting Success
DDF-G1				✓	16	3/16-4/23
DDF-G2	✓				2.5	
DDF-G3	✓				2.1	
DDF-G4	✓				1.6	
DDF-G5				✓	15.2	3/16-4/21
DDF-G6*				✓	25.0	3/16-5/15
DDF-G7*				✓	15.6	3/16-4/22
DDF-G8*				✓	16.1	3/16-4/23
DDF-G9*				✓	15.6	3/16-4/22
DDF-G10				✓	18.5	3/16-4/29
DDF-G12				✓	15.2	3/16-4/21
DDF-G13	✓				.4	
DDF-G14				✓	14.8	3/16-4/20
DDF-G15				✓	18.5	3/16-4/29 8/26-10/7 10/11-11/14
DDF-G16				✓	18.5	3/16-4/29
DDF-G17*				✓	26.8	3/16-5/19
DDF-G18*				✓	19.8	3/16-5/2
DDF-G19				✓	15.6	3/16-4/22
DDF-G20*				✓	25.5	3/16-5/16
DDF-G21*				✓	19.8	3/16-5/2
DDF-G22				✓	13.6	3/16-4/17
DDF-G23*				✓	17.7	3/16-4/27
DDF-G24*				✓	16.1	3/16-4/23
DDF-G25*				✓	15.6	3/16-4/22
DDF-G26*				✓	25.5	3/16-5/16
DDF-G27*				✓	19.8	3/16-5/2
DDF-G28				✓	16.9	3/16-4/25
DDF-G29				✓	28.4	3/16-5/23
DDF-G30				✓	25.5	3/16-5/16
DDF-G31				✓	16.1	3/16-4/23
DDF-G32				✓	16.5	3/16-4/24
DDF-G34	✓				3.3	
DDF-G35*				✓	14.4	3/16-4/19
DDF-G36	✓				0	
DDF-G37			✓		11.9	3/16-4/13
DDF-G38*				✓	18.5	3/16-4/29

*Gauge malfunctions at the beginning of the growing season. These gauges experienced data loss, but appeared to be inundated or saturated for more than 12 inches.

Table 2. 2003 HYDROLOGIC MONITORING RESULTS

Monitoring Gauge	< 5%	5 - 8%	8 – 12.5%	> 12.5%	Actual %	Dates Meeting Success
DDF-G1+				×	43	March 17-June 28
DDF-G2			×		8.3	March 17-April 5
DDF-G3		×			7.4	March 17-April 3
DDF-G4	×				4.1	
DDF-G5+				×	38.4	March 17-May 17 May 23-Aug 23
DDF-G6+				×	69.8	March 17-Sept 1
DDF-G7*+				×	14.5	March 17-April 20
DDF-G8				×	24.0	March 17-May 13 May 18-June 23
DDF-G9+				×	42.6	April 25-Aug 5 Sept 14-Nov 12
DDF-G10+				×	17.8	July 15-Aug 26
DDF-G12+				×	68.2	March 17-Aug 28
DDF-G13	×				2.5	
DDF-G14+				×	21.9	May 24-June 26 July 21-Aug 22
DDF-G15+				×	65.7	March 17-Aug 22 Sept 19-Nov 13
DDF-G16+				×	66.9	March 17-Aug 25
DDF-G17+				×	76.4	March 17-Sept 17
DDF-G18+				×	79.3	March 17-Sept 24
DDF-G19+				×	41.3	May 23-Aug 30
DDF-G20*					-	
DDF-G21+				×	61.5	April 29-Sept 25
DDF-G22+				×	20.5	March 17-April 23 July 2-Aug 20
DDF-G23+				×	75.5	March 17-Sept 14
DDF-G24+				×	69.7	March 17-Sept 1
DDF-G25+				×	44.3	March 17-June 4 June 7-Sept 22
DDF-G26+				×	91	March 17-Oct 23
DDF-G27+				×	32.0	March 18-June 3
DDF-G28+				×	100	March 17-Nov 14
DDF-G29+				×	100	March 17-Nov 14
DDF-G30+				×	43.0	March 17-June 28 July 1-Sept 1
DDF-G31+				×	73.4	March 17-Sept 10
DDF-G32+				×	27.5	March 17-May 21 July 1- Aug 31
DDF-G34				×	23.4	March 17-May 11
DDF-G35*					-	
DDF-G36*					-	
DDF-G37				×	15.6	March 17-April 22
DDF-G38				×	24.6	March 17-May 14 July 3-Aug 11
DDF-39			×		7.8	
DDF-40			×		7.8	

* Gauges have been replaced or misplaced without proper documentation. Gauge data may not be available.
+ Gauges met the success criterion during an average rainfall month (May, August, and September).

Specific Gauge Problems:

- For the 2003 monitoring year, several gauges were replaced or misplaced. Therefore these gauges may not contain the correct gauge serial number or

Table 1. 2004 HYDROLOGIC MONITORING RESULTS

Monitoring Gauge	< 5%	5 - 8%	8 – 12.5%	> 12.5%	Actual %	Dates Meeting Success
DDF-G1+				X	42.6	March 16-June 26
DDF-G2		X			5.0	
DDF-G3		X			5.0	
DDF-G4	X				2.9	
DDF-G5+				X	22.3	April 11-June 3
DDF-G6+				X	46.3	March 16-July 5
DDF-G7+				X	16.9	April 11-May 21
DDF-G8+				X	22.3	April 11-June 3
DDF-G9+				X	40.9	March 16-June 22
DDF-G10+				X	47.5	March 16-July 8 Aug 30-Oct 4
DDF-G12+				X	47.5	March 16-July 8 Aug 30-Oct 6
DDF-G13	X				2.5	
DDF-G14+				X	33.1	March 16-June 3
DDF-G15+				X	48.3	March 16-July 10 Aug 13-Nov 14
DDF-G16+				X	28.1	March 16-May 22 Aug 15-Oct 18
DDF-G17+				X	51.7	March 16-July 18
DDF-G18+				X	20.2	Aug 15-Oct 2
DDF-G19+				X	38.4	April 6-July 7 Aug 14-Oct 3
DDF-G20+				X	45.5	April 6-July 24 Aug 12-Oct 9
DDF-G21+				X	25.0	March 16-May 15 Aug 14-Oct 5
DDF-G22			X		10.2	
DDF-G23+				X	24.2	May 1-June 28
DDF-G24+				X	45.1	March 16-July 3
DDF-G25+				X	45.9	March 16-July 5
DDF-G26+				X	36.5	March 16-June 12
DDF-G27+				X	27.5	March 16-May 21
DDF-G28+				X	47.1	March 16-July 8
DDF-G29+				X	29.1	March 25-June 3
DDF-G30+				X	20.5	March 16-May 4
DDF-G31+				X	45.5	March 16-July 4
DDF-G32+				X	32.8	March 16-June 3
DDF-G34+				X	15.6	April 11-May 18
DDF-G35			X		8.6	
DDF-G36	X				2.0	
DDF-G37		X			5.3	
DDF-G38+				X	27.0	March 16-May 20
DDF-39		X			6.1	
DDF-40+				X	21.7	April 11-June 2

Table 1. Hydrological monitoring results for year 2005.

Monitoring Gauge	Percentage of Growing Season at Saturation (< 12" below surface)					Dates Meeting Success
	< 5%	5 - 8%	8 - 12.5%	> 12.5%	Actual	
DD1*	X				0.0	UNDETERMINED
DD2	X				3.7	
DD3				X	16.0	March 16 – April 23
DD4+	X				0.0	UNDETERMINED
DD5+	X				0.0	UNDETERMINED
DD6+	X				0.0	UNDETERMINED
DD7~	X				2.9	UNDETERMINED
DD8				X	26.2	March 16 – May 18
DD9				X	29.1	March 16 – May 25
DD10*	X				0.0	UNDETERMINED
DD12				X	28.7	March 16 – May 24
DD13	X				2.0	
DD14				X	26.6	March 16 – May 19
DD15				X	63.5	March 16 – June 21, June 26 – August 21
DD16				X	29.5	March 16 – May 26
DD17*	X				0.0	UNDETERMINED
DD18				X	39.3	March 16 – June 19
DD19				X	29.5	March 16 – May 26
DD20				X	70.1	March 16 – June 24, June 26 - September 3
DD21*	X				0.0	UNDETERMINED
DD22*	X				0.0	UNDETERMINED
DD23*	X				0.0	UNDETERMINED
DD24				X	29.5	March 16 – May 26
DD25~	X				4.1	UNDETERMINED
DD26*	X				0.0	UNDETERMINED
DD27+	X				0.0	UNDETERMINED
DD28				X	45.5	March 16 – May 29, July 14 – August 18
DD29				X	39.3	March 16 – June 19
DD30				X	36.5	March 16 – May 9, May 23 – June 25
DD31				X	29.1	March 16 – May 25, July 14 – August 19
DD32				X	26.2	March 16 – May 18
DD33	X				0.0	UNDETERMINED
DD34	X				2.5	
DD35*	X				0.0	UNDETERMINED
DD36	X				0.8	UNDETERMINED
DD37				X	17.6	March 16 – April 27
DD38				X	25.8	March 16 – May 17
DD39				X	16.0	March 16 – April 23
DD40				X	20.1	March 16 – May 3

* Gauges have been determined to be non-functional as of July 2005.

+ Gauge data for growing season absent due to gauge failure after July 2005.

~ Gauge data for growing season absent due to gauge failure prior July 2005.

Note: Gauges DD11, and DDRG-2 located near DD29, are rain gauges.

Table 1. Hydrological monitoring results for year 2006.

Monitoring Gauge	% of Growing Season at Saturation (< 12" below surface)				Actual	Dates Meeting Success
	< 5%	5 - 8%	8 - 12.5%	> 12.5%		
DD1				X	17.6	4/18 – 5/30
DD2	X				4.9	
DD3		X			7.8	
DD4	X				1.6	
DD5				X	18.9	3/16 – 4/15; 4/18 – 6/2
DD6				X	41.4	3/16 – 6/24; 9/1 – 11/6
DD7			X		11.1	
DD8				X	32.8	3/16 – 6/3
DD9				X	33.6	3/16 – 6/5
DD10				X	35.2	3/16 – 6/9; 9/1 – 8/6
DD12				X	33.6	3/16 – 6/5; 9/1 – 8/3
DD13	X				1.2	
DD14				X	16.4	3/16 – 4/24
DD15				X	42.2	3/16 – 6/26
DD16				X	27.5	3/16 – 4/16; 4/18 – 6/7; 9/1 – 11/6
DD17				X	42.6	3/16 – 6/27
DD18				X	49.6	3/16 – 7/14; 7/16 – 8/29; 8/31 -11/8
DD19				X	28.3	9/1 – 11/8
DD20				X	54.5	7/28 – 11/7
DD21				X	68.4	3/16 – 8/29; 8/31 – 11/7
DD22				X	14.8	4/18 – 5/23
DD23				X	51.2	3/17 – 7/19; 7/21 – 11/8
DD24				X	27.9	3/16 – 4/23; 9/1 – 11/7
DD25				X	43.9	3/16 – 7/30
DD26				X	50.8	3/17 – 7/18; 7/21 – 8/26; 9/1 – 11/8
DD27				X	48.8	3/16 – 7/12; 7/21 – 8/20; 9/1 – 11/7
DD28				X	48.0	3/18 – 7/12; 7/21 – 8/25; 9/1 – 11/7
DD29				X	67.6	3/17 – 8/28; 9/1 – 11/7
DD30				X	18.0	3/17 – 4/16; 4/18 – 5/31; 9/1 – 10/5; 10/8 - 11/7
DD31				X	34.0	3/17 – 6/7; 7/21 – 8/20; 9/1 – 11/6
DD32				X	21.3	7/9 – 8/29; 9/1 – 10/3
DD34		X			7.8	
DD35				X	15.6	4/18 – 5/25
DD36	X				3.7	
DD37				X	16.4	3/16 – 4/24
DD38				X	12.7	3/16 – 4/15
DD39			X		12.3	
DD40				X	14.3	4/26 – 5/30; 9/1 – 10/3

Stem Count Summary Data by Plot																				
			Plots																	
MY	**CY**	**Ave**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Y1	1999	**550**	515	652	476	486	575	612	442	501	540	464	680	340	680	645	574	505	614	466	330
Y2	2000																				
Y3	2001	**491**	441	680	255	583	541	317	527	394	440	495	680	340	482	384	468	505	514	408	194
Y4	2002	**505**	459	680	306	631	610	657	544	394	420	495	680	366	510	384	468	526	464	427	233
Y5	2003	**499**	459	680	255	680	593	680	544	376	380	510	680	366	482	401	340	461	415	427	214
Y6	2004	**474**	478	680	238	680	610	680	561	376	360	510	680	366	397	401	298	461	398	427	194
			Plots																	
MY	**CY**		**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**
Y1	1999		276	680	630	573	620	680	661	604	515	630	558	423	591						
Y2	2000																				
Y3	2001		221	680	680	537	440	680	602	510	478	514	558	478	429	680	593	276	283	680	680
Y4	2002		221	680	630	537	460	680	641	378	478	531	575	533	447	680	575	276	246	666	680
Y5	2003		239	680	630	608	360	680	661	416	496	547	575	496	447	680	575	257	302	680	680
Y6	2004		239	610	378	591	240	592	602	397	496	514	575	515	412	680	623	257	283	233	680