# Surveyor's Report

# Hydrology - Everglades Wells

NMI Project No. 1078.010 Report Date: September 15<sup>th</sup>, 2006 Submittal: One of One

Prepared for:

# South Florida Water Management District



2560 RCA Boulevard, Suite 105 • Palm Beach Gardens, Florida 33410 ph: 561.627.5200 • fax: 561.627.0983 • email: info@nickmillerinc.com www.nickmillerinc.com

# TABLE OF CONTENTS

Overview of The Project	. 3
Purpose	. 3
Location of Project	4
Items Delivered to The Client	4
Vertical Datum For The Project	4
Leveling Methods	5
Configuration of Level Runs	5
Equipment Used	. 5
GPS Methods	. 5
Introduction	5
Data Processing	6
Project Results	. 8
3A10	. 8
3ANE	. 8
3AS3W1	9
3BS1W1	9
BCA19	10
BCA20 1	10
BCNPA06 1	11
BCNPA08 BCA7	12
SGT5W1 1	12
SGT5W2 1	13
SGT5W3 1	13
Surveyor's Certification1	14

## **OVERVIEW OF THE PROJECT**

#### PURPOSE

The purpose of the Everglades Wells Project is to establish vertical control marks near each monitoring well. The monitoring wells are divided into two groups. The first group is located along Tamiami Trail. They are near established benchmarks which enabled us to utilize standard level runs to determine the elevations on those wells. The second group is located in remote areas of the Everglades. The remoteness of these wells meant that GPS observations were the only way to establish elevations on them. Also, due to the terrain, the Everglades sites were only accessible by airboat or helicopter.

The first group of wells in this project also further tests the application of Federal Geodetic Control Subcommittee (FGCS) Second-Order, Class II leveling procedures with Third-Order equipment. The goal of this hybrid pairing of procedures and equipment is to produce leveling measurements that will be acceptable to the National Geodetic Survey (NGS) and used in future vertical adjustments throughout the District.

This project utilizes uncalibrated "off-the-shelf" fiberglass level rods. Such rods are not currently approved by NGS for precise leveling (Second-Order Class II and above) for three primary reasons:

- 1. The fiberglass material used to construct the rods is less dimensionally stable than rods constructed of Invar metal.
- 2. The fiberglass rods are not individually calibrated by the manufacturer to identify scale errors across the length of the rod.
- 3. The fiberglass rods are a three-section snap-together style that will, over time, wear at the connection points creating error in measurements on the top two sections.

While these limitations make the rods unsuitable for the extreme precision required in First-Order and Second-Order, Class I leveling, it is the hypothesis of this project that such rods can deliver Second-Order, Class II precisions. Fiberglass rods are commonly used by surveyors today. In contrast, Invar level rods are expensive and specialized equipment only used by surveyors working on the highest precision vertical control surveys. By demonstrating that fiberglass level rods such as those used in this project are suitable for Second-Order, Class II leveling the District will benefit from the increased number of consultants using these rods. As a result, more level lines run within the District should meet NGS's requirements for inclusion in future vertical adjustments, further refining the elevation models used for water control.

## LOCATION OF PROJECT

The project is located in the Everglades. Following is a map and legend of the area.





## ITEMS DELIVERED TO THE CLIENT

The following items are delivered to the client with this report. Neither the report nor the items listed below are complete without the other.

- 1. Paper and electronic copy of field notes
- 2. Paper and electronic copy of all computation sheets
- 3. CORPSMET file for each site
- 4. Paper and electronic copy of site photographs
- 5. Paper copy of South Florida Water Management District Benchmark Description
- 6. Paper and electronic copy of NGS Blue Book submittal

## VERTICAL DATUM FOR THE PROJECT

The vertical datum for the project is the North American Vertical Datum of 1988. For correlation with older data sets, the elevations of the benchmarks are also shown in the National Geodetic Vertical Datum (NGVD) of 1929. The NGVD 29 elevations were derived using data provided by the South Florida Water Management District in a file named "NGVD29.TXT" when applicable, otherwise NGS superseded values were used. The linear unit for all elevations is the meter unless otherwise stated.

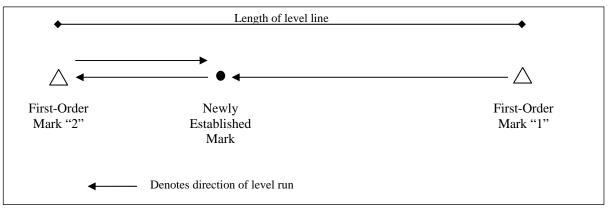
## LEVELING METHODS

#### CONFIGURATION OF LEVEL RUNS

The leveling for the project was performed in accordance with the Federal Geodetic Control Subcommittee standard for Second-Order, Class II geodetic leveling. A brief description of the procedures used follows.

For each level line, two existing First or Second Order vertical marks were used. The run was started at one of the First or Second Order marks and continued through the newly established mark near the structure and closed on the second First or Second Order vertical mark. The run was then looped back from the second First or Second Order mark to the newly established mark (see Figure 1 below).

#### Figure 1 Typical Level Run Pattern



The FGCS maximum allowable misclosure for this type of run is eight millimeters multiplied by the length of the line in kilometers.

## EQUIPMENT USED

All leveling during the project was performed with a Leica DNA03 digital level and Leica three-section, fiberglass bar-code level rods. Information and technical specification for the Leica DNA03 digital level are available at http://www.leica-geosystems.com.

## **GPS METHODS**

## INTRODUCTION

Due to the remote locations of the monuments located in the Everglades, it was decided that GPS observations were the only way to find elevation data on them. It was also determined that the most efficient mode of travel would be by helicopter, except for wells 3A10 and 3ANE. These two wells were only accessible by airboat.

The GPS observations for the project were performed in accordance with the Guidelines for Establishing GPS-Derived Ellipsoidal Heights (National Geodetic Survey Technical Memorandum NOS NGS-58).

GPS observations were conducted over five days:

- Tuesday, July 22<sup>nd</sup>, 2006
- Wednesday, August 23<sup>rd</sup>, 2006
- Thursday, August 24<sup>th</sup>, 2006
- Friday, August 25<sup>th</sup>, 2006
- Wednesday, September 6<sup>th</sup>, 2006

The following instrumentation was used for the GPS observations:

- (1) Trimble 4800 receiver/antennas
- (2) Trimble 5800 receiver/antenna
- (2) Trimble R8 receiver/antennas

## DATA PROCESSING

#### Data Acquisition

Data was downloaded from receivers to a desktop computer through the Trimble Geomatics Office software, version 1.63 (TGO).

#### Data Quality

The quality of the data was checked using the Timeline feature in the TGO software. Areas of the data that showed cycle slips were disabled. Due to minor problems with baseline processing, the Signal-to-Noise Ratio (SNR) was investigated for each satellite during each observation. Areas of data that had high SNR were removed before processing the baselines.

## **Baseline Processing**

Baselines were processed using TGO. For each session, (n-1) baselines were selected that produced fixed integer solutions with the lowest possible RMS values.

## Adjustment

The ADJUST software package from NGS was used for the network adjustment. The B-file, G-file and Serfil were exported from TGO. Initial positions and ellipsoidal heights of new marks were supplied in the creation of the B-file. Both the B-file and G-file were checked using the file-checking utilities that are a part of the ADJUST software package. The B-file was edited to conform to the structure and data content necessary to remove any errors found in the file-checking utilities. This included using NAVD 88 as the vertical datum and GEOID03 for the geoid.

After all files were checked and found to be satisfactory, a minimally-constrained adjustment was performed with no weighting applied. The ellipsoid and orthometric heights of the non-fixed control points were then checked against their published values. When these heights did not correlate well with the published values, they were removed from the adjustment. This was the case with the NGS benchmark U 501 in the final day of observations.

Using the standard deviation of unit weight from the first minimally-constrained adjustment, standard errors were scaled using the MODGEE program. A second minimally-constrained adjustment was performed with satisfactory results.

For the constrained horizontal adjustment, the published horizontal position and orthometric height for the control stations were fixed. The modified G-file, using the scaled standard errors, was used for this adjustment. The network adjustment was performed and no major shifts in position were found.

A minimally-constrained vertical adjustment was performed, with the horizontal position and orthometric height of a single control station being fixed. Again, the scaled G-file was used for this vertical adjustment. The orthometric heights of the non-fixed control points were checked against their published values.

A fully-constrained vertical adjustment was then performed with the published horizontal position and orthometric height of all accepted control stations being fixed.

Lastly, a final minimally-constrained adjustment with accuracies was performed, with little change in the statistics.

Although no major shifts in position were found in any of the networks following the adjustment in ADJUST, the residuals were unusually high in the adjustment results for some of the networks. This is most likely due to multi-path from the solar panel at each well location. These residuals are out of tolerance for NGS blue booking. Acceptable results were achieved with wells SGT5W1, SGT5W2, SGT5W3, BCA19 & BCA20. These wells will be submitted to NGS for blue booking.

## PROJECT RESULTS

The following tables list the elevations established for each new mark, the level run misclosure, "to-reach" description for each mark and a photo of the mark. All elevations are in US Survey Feet.

3A10	Elevation:	13.23	(NAVD 88)	14.67	(NGVD 29)
Bench Mark 1:	Z 497	11.25 ft	(NAVD 88)	12.72 ft	(NGVD 29)
Bench Mark 2:	U 501	25.24 ft	(NAVD 88)	26.68 ft	(NGVD 29)
Bench Mark 3:	FLGPS 64 AZ MK	9.80 ft	(NAVD 88)	11.25 ft	(NGVD 29)
Bench Mark 4:	N 410 X	12.70 ft	(NAVD 88)	14.16 ft	(NGVD 29)
Monitoring Well:	Reference Mark	16.91 ft	(NAVD 88)	18.35 ft	(NGVD 29)



To Reach 3A10:

FROM THE JUNCTION OF US 27 AND INTERSTATE 75. GO NORTH ON US 27 FOR 2.5 MILES TO AIRBOAT TOUR FACILITY ON RIGHT. GO EAST FOR +/-450 FEET TO BOAT RAMPS. FROM BOAT RAMPS HEAD 18.65 MILES BY AIRBOAT AT AN AZIMUTH OF 287° 41' 38" TO MARK.. LOCATED 0.50 FEET EAST OF EAST EDGE OF PLATFORM, 2.5 FEET SOUTH OF NORTHEAST CORNER OF PLATFORM, AND IS RECESSED 0.5 FEET BELOW PLATFORM. MAGNET PLACED INSIDE 6 INCH PVC CASING. ROD DEPTH IS 4.75 FEET.

"3A10" IS A SOUTH FLORIDA WATER MANAGEMENT DISTRICT (SFWMD) 9/16 INCH STAINLESS STEEL ROD SET INSIDE A 6 INCH PVC PIPE ENCLOSURE COVERED WITH AN ACCESS HATCH.

3ANE	Elevation:	11.25 ft	(NAVD 88)	12.71 ft	(NGVD 29)
Bench Mark 1:	Z 497	11.25 ft	(NAVD 88)	12.72 ft	(NGVD 29)
Bench Mark 2:	U 501	25.24 ft	(NAVD 88)	26.68 ft	(NGVD 29)
Bench Mark 3:	FLGPS 64 AZ MK	9.80 ft	(NAVD 88)	11.25 ft	(NGVD 29)
Bench Mark 4:	N 410 X	12.70 ft	(NAVD 88)	14.16 ft	(NGVD 29)
Monitoring Well:	Reference Mark	17.14 ft	(NAVD 88)	18.60 ft	(NGVD 29)



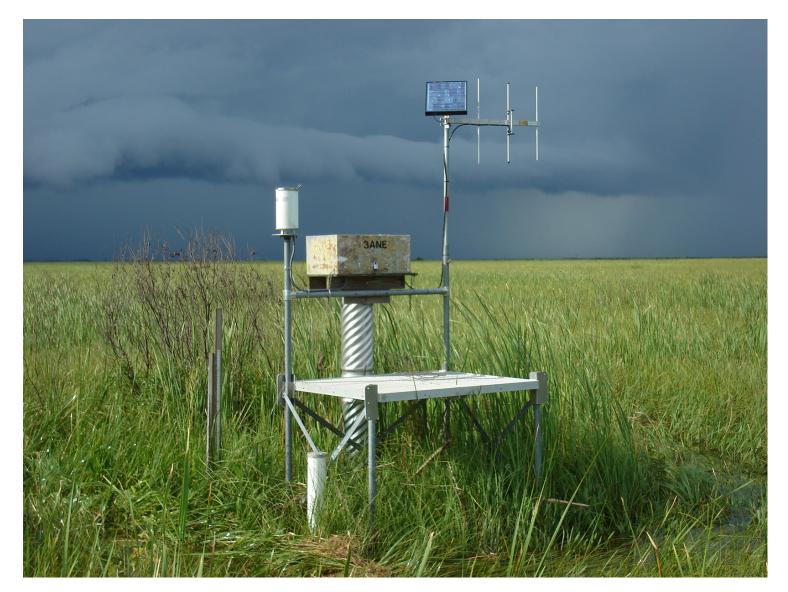
To Reach 3ANE:

FROM THE JUNCTION OF US 27 AND INTERSTATE 75. GO NORTH ON US 27 FOR 2.5 MILES TO AIRBOAT TOUR FACILITY ON RIGHT. GO EAST FOR +/-450 FEET TO BOAT RAMPS. FROM BOAT RAMPS HEAD 12.15 MILES BY AIRBOAT AT AN AZIMUTH OF 300° 48' 24" TO MARK.

LOCATED 4.6 FEET SOUTHWEST OF CORRIGATED PIPE FOR MONITORING WELL, 0.55 FEET WEST OF WEST EDGE OF PLATFORM, AND IS RECESSED 2.5 FEET BELOW PLATFORM. MAGNET PLACED INSIDE 6 INCH PVC CASING. ROD DEPTH IS 15.12 FEET.

"3ANE" IS A SOUTH FLORIDA WATER MANAGEMENT DISTRICT (SFWMD) 9/16 INCH STAINLESS STEEL ROD SET INSIDE A 6 INCH PVC PIPE ENCLOSURE COVERED WITH AN ACCESS HATCH.





Nick Miller, Inc. Date of Photo: September 6, 2006 View: Looking at the well facing north





Nick Miller, Inc. Date of Photo: September 6, 2006 View: Close-up of the well showing the contractor's markings

1	Jun-
1078.010 STAINLESS STEEL ROD SFWM	G. RAGER III. WED. SEPT. 6TH 2006
SET TO REFUSAL	W. KHAN 90°F, CLOUDY SFWMD-1618
SANE STILLING WELL	
	sut .
- MONUMENT SET TO REFUSAL @ 15.12.59	SIZANE SIZANE
- COORDINATES TO BANE MONUMENT	SOLAR SOLAR SOLAR
LAT: 26° 16' 07.92"	STAFE
Long: 80° 36 52.37'	GAUGE A
- COORDINATES TO 3ANE STILLING WELL	
LAT: 26° 16' 07.92"	
Long: 80° 36' 52.37''	RAIN GAUGE
- MONUMENT SET 4.6 FT. SW OF STILLING WELL	
" 2.5FT. BLOW PLATFORM	
1. 1. 1. O. 52 FT. SW OF PLATFORM	
- PICTURE #5 101-0050, 52, 53, 54, 55, 56, 57,58	
- STATT CARE ON A	MONUMENT ALUM. PLATFORM
- STAFF GAUGE @ 11.30 FT @ 10:30 A.M.	
- ROD RECESSED 0.8' AND A MAGNET	
WAS SET INSIDE LOGO CAP.	WETLANDS
- REFERENCE MARK IS 5.885' ABOUE	WEIL
BENCH MARK (HIGHER)	
(ELEVATION)	
di la companya da companya	Rector Control of Cont

Identification\_Information: Citation: Citation\_Information: Ōriginator: Nick Miller, Inc. (comp.) Originator: Stephen M. Gordon, PSM(ed.) Publication\_Date: 20060628 Publication\_Time: Unknown Title: S.F.W.M.D. Monitoring Well 3ANE Edition: 1 Publication\_Information: Publication Place: West Palm Beach, FL Publisher: South Florida Water Management District Description: Abstract: South Florida Water Management District Monitoring Well 3ANE. Purpose: To determine as built dimensions relative to NAVD 88 and NGVD 29 vertical datum Time\_Period\_of\_Content: Time\_Period\_Information: Single\_Date/Time: Calendar\_Date: 20060913 Currentness\_Reference: Publication Date Status: Progress: Complete Maintenance\_and\_Update\_Frequency: Unknown Spatial\_Domain: Boundi ng\_Coordi nates: West\_Boundi ng\_Coordi nate: -080D 50M 26.4S East\_Boundi ng\_Coordi nate: -080D 31M 47.5S North\_Boundi ng\_Coordi nate: +26D 19M 29.6S South\_Boundi ng\_Coordi nate: +26D 08M 45.0S Keywords: Theme: Theme\_Keyword\_Thesaurus: Tri - Service Spatial Data Standard Theme\_Keyword: Improvement Theme\_Keyword: Geodedic/Cadastral PI ace: Place\_Keyword\_Thesaurus: None Place\_Keyword: S.F.W.M.D. Monitoring Well 3ANE Place\_Keyword: Sec. 14, Twp. 48 S., Rge. 37 E Place\_Keyword: Broward County, Florida Place\_Keyword\_Thesaurus: Geographic Names Information System Place\_Keyword: Florida Place\_Keyword: Broward County Place\_Keyword: Deem City Access\_Constraints: None Use\_Constraints: None Point\_of\_Contact: Contact\_Information: Contact\_Person\_Primary: Contact\_Person: Howard Ehmke Contact\_Organization: South Florida Water Management District Contact\_Position: Project Manager Contact\_Address: Address\_Type: mailing and physical address Address: 3301 Gun Club Road City: West Palm Beach State\_or\_Province: Florida Postal\_Code: 33406 Country: USA Contact\_Voi ce\_Tel ephone: 561-682-6672 Contact\_Electronic\_Mail\_Address: hehmke@sfwmd.gov Data\_Quality\_Information: Attribute\_Accuracy: Attribute\_Accuracy\_Report: N/A Logical\_Consistency\_Report: Horizontal data was established using mapping grade GPS Page 1

**3ANE.** met

3ANE.met equipment. Vertical data was established using NGS control points Z 497, N 410 X, FLGPS 64 AZ MK & U 501. Coordinates are in the Florida State Plane Coordinate System, East Zone, NAD 83/90. Elevations are in the NAVD 88 and the NGVD 29. Completeness\_Report: Horizontal location taken at site benchmark Lat. +26D 16M 08S Long. -080D 36M 52S N 7Ŏ3,610 ft E 782,513 ft Site Benchmark. "3ANE" is a South Florida Water Management District (SFWMD) 9/16 inch stainless steel rod set inside a 6 inch PVC pipe enclosure covered with an access hatch. FROM THE JUNCTION OF US 27 AND INTERSTATE 75. GO NORTH ON US 27 FOR 2.5 MILES TO AIRBOAT TOUR FACILITY ON RIGHT. GO EAST FOR +/-450 FEET TO BOAT RAMPS. FROM BOAT RAMPS HEAD 12.15 MILES BY AIRBOAT AT AN AZIMUTH OF 300° 48' 24" TO MARK. LOCATED 4.6 FEET SOUTHWEST OF CORRIGATED PIPE FOR MONITORING WELL, 0.55 FEET WEST OF THE WEST EDGE OF PLATFORM, AND IS RECESSED 2.5 FEET BELOW PLATFORM. MAGNET PLACED INSIDE 6 INCH PVC CASING. ROD DEPTH IS 15.12 FEET. Benchmark Elevation is 11.25 feet (NAVD 88). Well Elevation (3ANE) is 17.14 feet (NAVD 88) as observed at the existing reference mark for the well which is a black mark at the top of a pipe at the center of the recorder box floor. NGVD 29 minus NAVD 88 equals 1.46 feet. The NGVD 1929 value was taken from a VERTCON orthometric height conversion for the coordinates of benchmark. Vertical Control used U 501 EL. 7.693 (m) (NAVD 88) EL. 8.133 (m) (NGVD 29), Z 497 EL. 3.430 (m) (NAVD 88) EL. 3.878 (m) (NGVD 29), N 410 X EL. 3.871 (m) (NAVD88) EL. 4.317 (m) (NGVD 29), FLGPS 64 AZ MK EL. 2.987 (m) (NAVD88) FL. 3.429 (m) (NGVD 29). Positional\_Accuracy: Hori zontal \_Posi ti onal \_Accuracy: Horizontal\_Positional\_Accuracy\_Report: The horizontal position of Site Benchmark "3ANE" was established using a mapping grade GPS receiver (Trimble Pro XR in accordance with the Florida Minimum Technical Standards (Chapter 61G17-6, Florida Administrative Code) Quanti tati ve\_Hori zontal \_Posi ti onal \_Accuracy\_Assessment: Horizontal\_Positional\_Accuracy\_Value: 3 to 5 meters Horizontal\_Positional\_Accuracy\_Explanation: The intended positional accuracy for this survey is 3 to 5 meters more or less. Vertical\_Positional\_Accuracy: Vertical\_Positional\_Accuracy\_Report: A static GPS survey was conducted to find the vertical location of the monument. The survey was designed in accordance with the standards of the FGCC manual and Ronnie Taylor of NGS. The control used for this survey was U 501, Z 497, FLGPS 64 AZ MK, N 410 X. Quanti tati ve\_Verti cal \_Posi ti onal \_Accuracy\_Assessment: Verti cal \_Posi ti onal \_Accuracy\_Val ue: N/A Verti cal \_Posi ti onal \_Accuracy\_Expl anati on: N/A Li neage: Process Step: Process Description: The horizontal work was performed using a Trimble Pro XR GPS receiver (mapping grade). The vertical data was found by using Trimble 4800, 5800 & R8 GPS receivers in a static GPS network. Process\_Date: 20060906

Metadata\_Reference\_Information:

Metadata\_Date: 20060913 Metadata\_Contact: Contact\_Information: Contact\_Person\_Primary: Contact\_Person: Stephen M. Gordon Contact\_Organization: Nick Miller, Inc. Contact\_Position: Project Surveyor Contact\_Address: Address\_Type: mailing and physical address Address: 2560 RCA\_BIvd., Suite 105 City: Palm Beach Gardens State\_or\_Province: Florida Postal\_Code: 33410 Country: USA Contact\_Voi ce\_Tel ephone: 561-627-5200 Contact\_Facsi mi l e\_Tel ephone: 561-627-0983 Contact\_El ectroni c\_Mai l\_Address: sgordon@ni ckmi l l eri nc. com

Metadata\_Standard\_Name: FGDC Content Standards for Digital Geospatial Metadata Metadata\_Standard\_Version: 2.0 Metadata\_Time\_Convention: Local time

Metadata\_Access\_Constraints: South Florida Water Management District controls

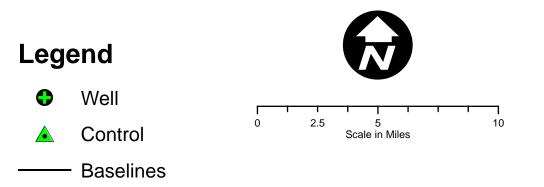
access.

Metadata\_Use\_Constraints: Per South Florida Water Management District Metadata\_Securi ty\_Information: Metadata\_Securi ty\_Handling\_Description: None

Metadata\_Securi ty\_Cl assi fi cati on: Uncl assi fi ed Metadata\_Securi ty\_Cl assi fi cati on\_System: Structure

## Wells 3A10 & 3ANE Session 1

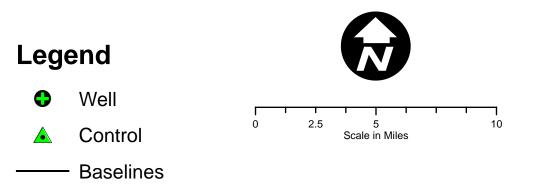






## Wells 3A10 & 3ANE Session 2







								/				Þ	m	/Y
M. W. Walder	Station	Designation:	(check a	pplicable:	FBN_	СВ	N_PAC_S	АС √ВМ	) Station	n PID, if a	ny:	Date	e <sup>t</sup> (UTC):	/
GPS TORP IIO	N 3A	INE.	-1									6.	9	2006
OBSERVATIC	N General	Location:				Airpo	ort ID, if any:		Station	n 4-Chara	cter ID:	_	of Year:	
April 16, 2003	3		·			Deale			01-11-1	0.1.1.4	(0.011)			
Project Name:	wmp	MONITOR	RING	WELL	5	Proje	ect Number: GPS- )	078.0		n Serial #	(SSN):	Ses	sion ID:( $A$	A,B,C etc)
NAC	83 Latitude		NAD83	Lonaitude	3	NAC	083 Ellipsoida	Height	Agenc	y Full Nar	ne:NIC	KM	ILLEI	RINC
-6-16	07.92	. 80		252	.37	NA\	/D88 Orthome	met etric Ht.	ers Opera	tor Full Na	ame: <i>GL</i>	ĽĔN,	N RA	IGE R III
Observation Se Sched. Start	030 Stop	1145		= <u>15</u> se	conds	GEO	DID99 Geoid I	met leight	Phone	#:(56)		-		1
Actual Start <u> </u>	<u>143</u> stop_	1149	Elevati Mask =	on 10 De	egrees			met	ers e-mail	address:	INFOE	ŶNC.	KM12	LERIN
Receiver Bra			Anter	ina Cod						a plumb be a plumb aff		ion? n?		Circle Yes or No
	MBLE	K8		TR	INF	<u>H</u>	FR	8	Antenn	a oriented	to true No	rth?		-lf no, explain
P/N: 50158-	66		P/N: 3	0158	-66		د ا			a ground p			Ø/N)	"
S/N: 4507/4 Firmware Versi	44-966 on:	/	S/N: 4 Cable	1507/ Length, m	<i>44-9(</i> eters:	06				ia radome u ric occupat			(Y 100)	lf yes, describe.
CamCorder Batter	ry, 🗇 12V DC, 🗇	110V AC, Other	1	-			ection) from antenr	na.	Any ob	structions a	bove 10°	?	(Y / 🕅 🗌	Use
				-T						e Session I		<u> </u>	(Y / N/	Vis. form on Ends:
Tripod or An Fixed-Leg Tripod, Brand & Model:		Rear G	d Mount 25 Para						Me	iters I	Feet		Meters	Feet
P/N: S/N:	SELO CH	FLOIV CH	,	1.	itum point	to Top	of Tripod (Tri	pod Height						
Last Adjustmer	nt date:	1/A								$\neq$		$\leq$	<u> </u>	
Psychromet	er (if used)	Brand & Mo	del:	B=Add	ditional of	fset to .	ARP if any (Trib	rach/Space	er)					
P/N:		/				-	• A + B		<u> </u> 1	7	300			7.300
S/N: Last Calibration	or check Det	. (					lenna Reference	e Point (AR	<u> </u>	/or sketch		leuol	condition	
					s = Feet Entered	•	Receiver =	me	ters. Be Ver	y Explicit	as to wh	iere a	nd how N	s. /leasured!
Barometer ( Model:	if used) Bra		ather ata	Weather Codes		ime JTC)		b Temp it Celsius		lb Temp it Celsius	Rel. Humi			Pressure Ig millibar
C/NI-		Ве	fore	)[[][	10	43			/		se la companya de la	/		
S/N:		Mi	ddie 🏠		110	70				$\langle$				
	·	A	fter	)	110	49			$\top$		V			
Remarks, C	omments o	n Problems.	Sketche	es. Penc	il Rubb	pina.	etć:			_	4		ν	
		,		,										
		den de 147- 11		-41			*	<b>J</b>	frame 1 1 -	- 6I - f		1	4 a.c. P	-
Veather Data File Nam	·····	uired. Weather	uata are o	puonal bui	encoura	igea.	*Antenna coo Updated Statio							ator. HECKED
(Standard NGS	6 Format = aaa	addds.xxx) of Year, s=Session I	D, xxx≕file de	pendant exter	nsion		Visibility Obstru Photographs o Pencil Rubbing	uction Forn f Station:	n: 🗊 Attached	d ⊡ Subm d ⊡ Subm	itted earlie	er		BY:
Table of	CODE	PROBLEM		VISIBILIT			TEMPERATU	RE	CLOUD	COVER			WIND	
Weather	0	did not occu	r Goo	d, over 15	miles	N	ormal, 32° F-	80° F	Clear, bel	ow 20%	Cal	m, uno	der 5mph	n (8km/h)
Codes	1	did occur	Fa	uir, 7-15 m	iles	Ho	ot, over 80°F (	27 C)	Cloudy, 20	% to 70%	M	lodera	ite, 5 to 1	5 mph
	2	- not used -	Poo	r, under 7	miles	Col	d, below 32° l	= (0 C)	Overcast, o	over 70%	Stror	ng, ove	er15 mph	n (24km/h)
Examples:	00000 = No	problem, good	visibility, n	ormal tem	p, clear.	calm	wind 12	2121 = P	roblems, po	or visibility	, hot, ov	/ercas	t, moder	rate wind

SFWMD       MONITARING       WELLS       GPS-1078.010       ZH         NAD83 Latitude       NAD83 Longitude       NAD83 Longitude       Agency Full Name: //1 // // // // // // // // // // // //								/				D/m	1Y	
Class Control       General Location:       Airport ID, If any:       Station 4-Character ID:       Day of Year:         Void       Aprict R2003       Project Number:       GPS / 078,010       Station Serial # (SSN):       Session ID:(A,B,C etc);         You and the session of the session?       Agency Full Name: // (C, m) LLER / N/C,       Operator Full Name: // (C, m) LLER / N/C,         You and the session of the session?       NADB3 Longitude       NADB3 Control (C, m) LLER / N/C,       Operator Full Name: // (C, m) LLER / N/C,         You and the session?       Station 4-Character ID:       Day of Year:       Operator Full Name: // (C, m) LLER / N/C,         You and the session?       Station 4-Character ID:       Day of Year:       Operator Full Name: // (C, m) LLER / N/C,         You and the session?       Agency Full Name: // (C, m) LLER / N/C,       N/D BB Clipped Gend Height       Agency Full Name: // (C, m) LLER / N/C,         Receiver Brand & Model:       Antenna bumb better session?       Antenna bumb better session?       N/N       If no, we and the second r			1	(check a	pplicable:F	BNCE	BNPAC_S	ас <u>V</u> вм	) Station	PID, if an	· I			
April 102 200       Control is balance in the control of				Ζ										
Project Name:       Project Number:       GP3-1078.010       Station Serial # (SSN):       Session ID:(A,B,C etc)         NAD83 Latitude       NAD83 Longitude       NAD83 Longitude       Agency Full Name; //1 (       MAD83 Longitude         C6       16       0.7.972       80       36       5.2.37         NAD83 tatitude       NAD83 Chongitude       NAD83 Chongitude       Agency Full Name; //1 (       MAD84 Chongitude         Deservation Session Times (UTC):       Epoch       Epoch       Interval - 1/2 Seconds       Epoch         Status 1/2.30stop34/5       Epoch       Interval - 1/2 Seconds       EGOID99 Geoid Height       meters         GEOID99 Geoid Height       meters       GEOID99 Geoid Height       meters       Antenna plumb before session?       (N)       N)       Ves or No         NM BLE       R 8       N/M BLE       R 8       N/M BLE       R 8       N/M BLE       R 8       N/M BLE       N 40000100000000000000000000000000000000	LOG		Location:			Airp	ort ID, if any:		Station	4-Charac	ter ID: D	ay of Year		
SFWMD       MINITARING       WELLS       GPS-1078.010       Z.A         NADB3 Latitude       NADB3 Latitude       NADB3 Latitude       Agency Full Name: //1 (2, m)/2 (2, m	Project Name:	<u> </u>			<u></u>	Proj	ect Number:		Station	 Serial # (	SSN): S	ession ID:	(A,B,C etc)	
2.6° 1/6 07.92       80° 36.52.37       meters         Deservation Session Times (UTC):       Epoch       Seconds       meters         Sched. Start [2:30Stop ]345       Epoch       Seconds       meters         GEOID99 Geoid Height       meters       e-mail address/m/FG/C/MC/M/L/LER/MC/         Natual Start [2:30Stop ]345       Antenna Code*, Brand & Model:       Antenna plumb before session?       NN         TR IM BLE       R 8       TR IM BLE       R 8       NN       NN       Antenna plumb before session?       NN       NN       NN       e-mail address/m/FG/C       Antenna plumb before session?       NN       NN       NN       e-mail address/m/FG/C       Antenna plumb before session?       NN       NN       NN       e-mail address/m/FG/C       Antenna plumb before session?       NN       NN       NN       e-mail address/m/FG/C       Antenna plumb before session?       NN       NN       NN       e-mail address/m/FG/C       Antenna plumb after session?       NN       NN       NN       e-mail address/m/FG/C       Antenna plumb after session?       NN       NN       NN       e-mail address/m/FG/C       Antenna plumb after session?       NN       NN       NN       e-mail address/m/FG/C       Antenna plumb after session?       NN       NN       NN       e-mail address/m/FG/C       Antenna plum	·	ND MO	NITORI	VG	NEL	•		078.0	10			ZA		
Deservation Session Times (UTC): Sched. Start <u>/ 2.3</u> (25top <u>/ 3.4</u> +5       Epoch Interval=/_5 Seconds Elevation Mask = <u>/ 0</u> Degrees       meters GEOID99 Geoid Height meters       Phone #: (56) (2.7 - 52.00         Receiver Brand & Model:       Antenna Pumb before session? Mask = <u>/ 0</u> Degrees       Antenna pumb before session? Mask = <u>/ 0</u> Degrees       Antenna pumb before session? Mask = <u>/ 0</u> Degrees         T R IM BLE R 8 PIN: 50/58-66 SIN: 4507/144966       Antenna Code*, Brand & Model: TR IM BLE R 6 SIN: 4507/144966       Antenna Code*, Brand & Model: TR IM BLE R 8 PIN: 50/58-66 SIN: 4507/144966       Antenna cound plane used?       Antenna ground plane used?         Pin: 50/58-66 SIN: 4507/144966       Vehicle is Parked @00 meters       Started form antenna.       Antenna ground plane used?       Antenna ground plane used?         Cable Length, meters: Interval to finder started for used North: SIN: 250/57/144966       Vehicle is Parked @00 meters       Started form antenna.       Antenna started for used?       Mit yes, form describe. Antenna reference source meanstry (1/10) Use form antenna.         Tripod or Antenna Mount: Check fine: Irread a findozet for antenna Mount: Irread a findozet for antenna Mount: SN: SN:       Model: SN: 4       Mater Session Begins: Meters Feet       After Session Ends: Meters Feet         Maters Start dijustment date: SN: SN: SN:       Meters Feet (f used) Brand & Model: SN: SN:       Meters Feet (f used) Brand & Model: SN: SN: SN: SN: SN: SN: SN: SN: SN: SN			P1				D83 Ellipsoida	-	ore I					
Sched. Start       12.3.05 top       13.4.5       Interval=/2 Seconds       GEOID99 Geoid Height         Actual Start       12.3.05 top       13.4.5       File Version       GEOID99 Geoid Height         Receiver Brand & Model:       Antenna Rode*, Brand & Model:       Antenna plumb before session?       (//)       Circle         T R IM BLE       R 8       T R IM BLE       R 8       (//)       Version?       (//)       Version?         SN: 50158-66       P/N: 50158-66       P/N: 50158-66       (//)       (//)       (//)       explain         SN: 45071/44966       P/N: 50158-66       Version?       (//)		0 10 10	80		, 52.3		VD88 Orthome		Operato	r Full Na	me:GLE	NN RAE	HER III	
Actual Start 1230 Stop 1345       Elevation         Receiver Brand & Model:       Antenna Code*, Brand & Model:         TRIMBLE R8       Antenna Code*, Brand & Model:         TRIMBLE R8       TRIMBLE R8         PN: 50158-66       PN: 50158-66         SN: 4507144966       PN: 50158-66         Immovier Version:       PN: 50158-66         PN: 50158-66       PN: 50158-66         SN: 4507144966       PN: 50158-66         SN: 50058-66       PN: 50158-66 <t< td=""><td>Sched. Start _/</td><td><math>\frac{230}{230}</math>Stop</td><td>1345</td><td>Interval</td><td></td><td>Is GE</td><td>OID99 Geoid I</td><td></td><td>ers Phone #</td><td>:(56)</td><td>1627</td><td>-520</td><td>00</td></t<>	Sched. Start _/	$\frac{230}{230}$ Stop	1345	Interval		Is GE	OID99 Geoid I		ers Phone #	:(56)	1627	-520	00	
TRIMBLE R8       TRIMBLE R8         TRIMBLE R8       TRIMBLE R8         PN: 50158-66       FRIMBLE R8         PN: 50158-66       PN: 50158-66         SN: 45071/44966       PN: 50158-66         Cambod Length, meters:       State of the second of the	Actual Start <u>/</u>	<u> 230</u> Stop_	1345					-	ers e-mail a	ddress <b>/</b> //	NFORM	VICKMIL	LERINC	
TRIMBLE R8       TRIMBLE R8         PIN: 50/58-GG       TRIMBLE R8         SN: 4507/449GG       TRIMBLE R8         TRIMBLE R8       PIN: 50/58-GG         SN: 4507/449GG       TRIMBLE R8         TRIMBLE R8       PIN: 50/58-GG         SN: 2000 TANEAN MODEL:       PIN: 50/58-GG         TRIMBLE R8       Pined Mount: 50/60 meters         TRIMBLE R8       PIN: 50/58-GG         SN:       TRIMBLE R8         TRIMBLE R8       PIN: 50/58-GG         SN:       SN:         Anterna orionation doffset bo ARP if any (Tripod Height)         Beadditional offset to ARP if any (Tripod Heig				Anten	na Code*,	Brand &	& Model:	4						
PN: 5015 8 - 66 SN: 45 07 144966       PN: 5015 8 - 66 SN: 45 07 144966       Antenna ground plane used?       N         Primedre Version:       PN: 5015 8 - 66 SN: 45 07 144966       Antenna ground plane used?       N         Cable Length, metters:       Scale Length, metters:       Scale Length, metters:       Antenna adome used?       N         Carnorder Battery, DI 12V DC, DI 10V AC, brother       Prixed Adometers:       Scale Length, metters:       N       Scale Length, metters:       Scale Length, metters:       Scale Length, metters:       N       N       Scale Length, metters:       N       Scale Length, metters:       N       Scale Length, metters:       Scal			3	-	TRIME	BLE	R8		Antenna	oriented to	true North?	nt. (0/N)	-lf no,	
acamcorder Battery, □ 12V DC, □ 110V AC, Wolther       Vehicle is Parked @ meters	P/N:50158	-66		P/N: 5	158-60									
In CarnCorder Battery, 0 12V DC, 0 110V AC, Wolther       Vehicle is Parked.@000_meters       Sciencetion) from antenna.       Any obstructions above 10°?       Y/Y       Use Radio Interference source nearby (Y)       Vehicle is Parked.@000_meters         Tripod or Antenna Mount:       Check Pre:       ** ANTENNA HEIGHT **       Before Session Begins:       After Session Ends:         Prixed-Leg Tripod,	S/N: 45 07 Firmware Versi	ion:		Cable L	ength, meters	466								
Tripod or Antenna Mount: Check øne:         Fixed-Leg Tripod       Ocilapsible-leg tripod       After Session Ends:         Meters       Fixed-Leg Tripod       Ocilapsible-leg tripod       After Session Ends:         Meters       Fixed-Leg Tripod       Ocilapsible-leg tripod       After Session Ends:         Meters       Before Session Begins:       After Session Ends:         Meters       Feet         After Session Ends:         Meters       Feet         Meters       Before Session Begins:       After Session Ends:         Meters       Feet         After Session Ends:         Meters       Feet         Additional offset to ARP if any (Tripod Height)         Betaum point to Top of Tripod (Tripod Height)         Betaum point to Top of Tripod (Tripod Height)         Betaum point to Antenna Reference Point (ARP)       7.300       7.300         Prix:         Sin:       Meters       Feet x (0.3048)       Note	CamCorder Batte	ny, 🗆 12V DC, 🗆 ′	110V AC, VOther	Vehicle is	Parked <b>3000</b> me	ters <u>S</u> (di	rection) from anten	na.	Any obst	ructions al	oove 10°?	(YID)	Use	
If Fixed-Leg Tripod, B Collapsible-leg tripod WErked Mount Tradit & Model:       If Note & Collapsible-leg tripod WErked Mount Tradit & Model:         Prixed & Model:       Image: Second Content of the second of the secon		ntenna Mour	t: Check one:		** AN	TEN		HT *	e Before S	Session B	egins:	After Sess	ion Ends:	
S/N:       .ast Adjustment date:       A= Datum point to Top of Tripod (Tripod Height)         Psychrometer (if used) Brand & Model:       B=Additional offset to ARP if any (Tribrach/Spacer)         P/N:	Brand & Model	□ Collapsible 5Ê CO CAR	leg tripod Striked BON GP5 Pa	Mount NLE								NIGICI S		
Psychrometer (if used) Brand & Model:       B=Additional offset to ARP if any (Tribrach/Spacer)         P/N:       H= Antenna Height = A + B         P/N:       Datum Point to Antenna Reference Point (ARP)         S/N:       Meters = Feet x (0.3048)         Barometer (if used) Brand &       Weather         Barometer (if used) Brand &       Weather         Barometer (if used) Brand &       Weather         Barometer (if used) Brand &       Meether         Barometer (if used) Brand &       Meather         Barometer (if used) Brand &       After         O////       I///         Barometer (if used) Brand &       After         O////       I///	P/N: S/N:		,		A= Datum	point to To	p of Tripod (Tri	pod Height	)		$\square$			
Psychrometer (if used) Brand & Model:       H= Antenna Height = A + B       7.300       7.300         P/N:       Datum Point to Antenna Reference Point (ARP)       7.300       7.300         S/N:       Meters = Feet x (0.3048)       Note &/or sketch ANY unusual conditions.         Barometer (if used) Brand &       Weather Data       Weather Codes       Time Codes       Dry-Bulb Temp Fahrenheit Celsius       Ref. %       Atm. Pressure inches Hg millibar         S/N:       Middle       0////       1230       Image: Sine Codes       Middle       After       0////       1345	Last Adjustmer	nt date: 🔨	A		B=Addition			roch/Snac						
P/N:       = Datum Point to Antenna Reference Point (ARP)       1.300       1.300         S/N:      ast Calibration or check Date:       Meters = Feet x (0.3048) Height Entered Into Receiver = meters. Be Very Explicit as to where and how Measured!         Barometer (if used) Brand & Model:       Weather Data       Time Codes       Dry-Bulb Temp Fahrenheit Celsius       WetBulb Temp Fahrenheit Celsius       Rel. % Humidity       Atm. Pressure inches Hg millibar         S/N:       Middle       0////       1.345       0       0       0	Psychromet	er (if used)	Brand & Mod	el:			- · ·		")					
S/N:       Meters = Feet x (0.3048) Height Entered Into Receiver =meters. Be Very Explicit as to where and how Measured!         Barometer (if used) Brand & Model:       Weather Data       Veather Codes       Time (UTC)       Dry-Bulb Temp Fahrenheit Celsius       WetBulb Temp Humidity       Rel. % Humidity       Atm. Pressure inches Hg millibar         S/N:       Middle       0////       1/2/3/0       0       0       0       0         After       0////       1/3/4/5       0       0       0       0       0       0	P/N:					-		a Point (AR	P)	7.	300		7.300	
Barometer (if used) Brand &       Weather Data       Weather Codes       Time (UTC)       Dry-Bulb Temp Fahrenheit Celsius       WetBulb Temp Fahrenheit Celsius       Rel. % Humidity       Atm. Pressure inches Hg millibar         S/N:       Middle       0////       1230       0       0       0       0         After       0////       1345       0       0       0       0       0       0	S/N: Last Calibratior	n or check Date								r sketch	ANY unusu	al condition	ns.	
Model:     Data     Codes     (UTC)     Fahrenheit     Celsius     Fahrenheit     Celsius     Humidity     inches     Hg       S/N:     Middle     0////     1230     0     0     0     0       After     0////     1345     0     0     0     0						ered into	Receiver =	me	ters. Be Very	Explicit	as to where	and how	Measured!	
Middle         0////         /////         ////         /////         /////         /////         /////         /////         /////         /////         /////         /////         /////         /////         /////         /////         /////         /////         /////         ////// <th <="" th="">         //////         //////</th>	//////         //////	Barometer ( Model:	if used) Bra			-							Atm.	
Middle         0////         1310           After         0////         1345	0.41		Bef	ore /)	1111 1	230	)	- /		$\Box$				
After 0//// 1345	S/N:		Mic	ldle /	1111 1	310				1	1			
			Af	ter /			-//			1	$\checkmark$	17		
	Remarks, C	omments or	n Problems,	Sketche						<u> </u>	<u>.</u>			
	Weather	codes are requ	iired. Weather d	ata are or	itional but enc	ouraged.	*Antenna co	te comes	from ant info	file furnis	hed by pro	iect coordi	nator.	
Weather codes are required. Weather data are optional but encouraged. *Antenna code comes from ant info file furnished by project coordinator.							Updated Static	n Descripti	on:	🗇 Submi	tted earlier	LOG C	HECKED	
Weather codes are required. Weather data are optional but encouraged.       *Antenna code comes from ant_info file furnished by project coordinator.         Data File Name(s):       Updated Station Description: □ Attached □ Submitted earlier       LOG CHECKED				voorafile de a			Photographs o	f Station:	Attached				BY:	
Data File Name(s):       Updated Station Description: <ul> <li>Attached</li> <li>Submitted earlier</li> <li>Visibility Obstruction Form:</li> <li>Attached</li> <li>Submitted earlier</li> <li>BY:</li> </ul> LOG CHECKED           (Standard NGS Format = aaaaddds.xxx)         Data File Name(s):         Dattached           (Standard NGS Format = aaaaddds.xxx)         Dattached         Dattached         Dubmitted earlier         BY:           Data File Name(s):         Dattached         Dattached         Dattached         Dattached         BY:	Table of	CODE	PROBLEM							OVER		WIND		
Data File Name(s):       Updated Station Description: □ Attached □ Submitted earlier Visibility Obstruction Form: □ Attached □ Submitted earlier Photographs of Station: □ Attached □ Submitted earlier Photographs of Station: □ Attached □ Submitted earlier BY:       LOG CHECKED         (Standard NGS Format = aaaaddds.xxx) where aaaa=4-Character ID, ddd=Day of Year, s=Session ID, xxx=file dependent extension       □ Attached □ Submitted earlier Photographs of Station: □ Attached □ Submitted earlier Photographs of Station: □ Attached □ Submitted earlier Photographs of Mark: □ Attached □ Submitted earlier Photographot Photographs of Mark: □ Attached □ Submitt	Weather	0		_		s I					Calm,		h (8km/h)	
Data File Name(s):       Updated Station Description: □ Attached □ Submitted earlier Visibility Obstruction Form: □ Attached □ Submitted earlier Photographs of Station: □ Attached □ Submitted	Codes	1	did occur			_			Cloudy, 20%	to 70%		· · · · · ·	<u> </u>	
Data File Name(s):       Updated Station Description: □ Attached □ Submitted earlier Visibility Obstruction Form: □ Attached □ Submitted earlier Photographs of Station: □ Attached □ Submitted earlier □ Subm		2	- not used -	-									-	
Data File Name(s):       Updated Station Description: □ Attached □ Submitted earlier Usibility Obstruction Form: □ Attached □ Submitted earlier □ Attached □ Submitted earlier □ Submitted earlier □ Attached □ Submitted earlier □ Submitted earlier □ Attached □ Submitted earlier □ Attached □ Submitted earlier □ Submitted earlier □ Attached □ Submitted earlier □			problem, good v						roblems, poor					

							1				D	m.	14
CPL DOAD 10		esignation:	(check ap	plicable: FBN	<b>1 СВ</b>	NPACS	AC BM)	Static	n PID,	if any:		até (UTC)/ 9	2006
DBSERVATIC LOG April 16, 200	N General I	·			Airpo	ort ID, if any:		Statio	n 4-Ch	aracter		ay of Year	
roject Name:		ONITORI	NG	WELLS		ect Number: GPS-//	78.01		on Seria	al # (SS	SN): Se	ession ID: ZB	(A,B,C etc)
NAC	083 Latitude		NAD83 I	ongitude	NA	083 Ellipsoida	l Height	Agen	cy Full	Name:	NICKI	MILLE	RINC.
	07.92			52.37		/D88 Orthome	mete etric Ht.	opera	ator Fu	II Name	GLEI	NN K	AGERI
bservation Se ched. Start <u>/</u>	ession Times (U <u>6 1 5</u> Stop _	17): <u>/7/5</u>		15 Seconds	GE	OID99 Geoid I	mete -leight	Phon	e #: ( 🖍	561)	6z7	'-5Z	00
ctual Start <u>/</u>	615 Stop_	1705	Elevation Mask = _	Degrees			mete	ers e-mai	l addre	ess:///P	OPNIC	EMILL	ERINCIC
TRI	and & Mode MBLE - 66	~ ~	e	na Code*, Br TRIM 0158-6	BL	100 June		Anten Anten Weath	na plum na orien ner obse	b after s ited to tru	e session? eession? ue North? antenna ht used?	()/N)	Circle Yes or No -If no, explain "
/N:50/58 /N:4507 irmware Versi CamCorder Batter	<b>144966</b> on: лу, а 12V DC, а 1	10V AC, Ø Other		0   5 9 - 6 50 7   44 ength, meters: <sup>parked</sup> , 00 Ometers		ection) from antenr	na.	Eccen Any of	tric occ ostructio	ons abov	(>0.5 mm)'	(Y/K)	lf yes, describe. Use Vis. form
Fixed-Leg Tripod, rand & Model	tenna Moun □ Collapsible-I SECo CAR	t: Check one. eg tripod tyfixed M BON GPS PO	lount ILE	** ANT	ENI	NA HEIG	SHT **		e Sess eters	ion Begi Feet		After Sess Meters	ion Ends: Feet
/N: /N:				A= Datum poir	nt to Top	o of Tripod (Tri	pod Height)				1		
ast Adjustmer		MA Brand & Mode	<u></u>	<b>B=</b> Additional o	offset to	ARP if any (Trib	rach/Space	n /	~	/			/
/N:			/	H≕ Antenna H ≕ Datum Poi	•	<b>: A + B</b> tenna Reference	Point (AR			7.30	20		7.300
/N: ast Calibratior	n or check Date	:		Meters = Fee Height Entere	et x (0.3	048)	· · · · ·		/or ske	etch AN	Y unusua	al condition	ns.
arometer ( lodel:	if used) Brar	nd & Weat Dat		Veather	Time (UTC)	Dry-Bu	lb Temp it Celsius	WetBu Fahrenh	ilb Ten	np	Rel. % Humidity	Atm.	Pressure Hg millibar
;/N:		Befo	ore ()2	2122 16	15		$\square$			~	· · · /		
		Mido	ile 02	Z)ZZ 16	,45	1 /	1	1	1				X
		Afte	er ()2	2 zz 7	705	-/_	2				/	$\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{\mathbf{$	e a
ENDED	SESSI	N Problems, S ON FEV 97HER	U m	NUTES	5 E.		DVE	TO					
			ta ara ani	ional but encou	raged.	*Antenna coo						T	nator.
Weather	······	ired. Weather da			1	The state of the state							1.100.00.000
Weather ata File Nam Standard NGS	e(s): 6 Format = aaaa	<u> </u>		ndant extension		Updated Statio Visibility Obstru Photographs o Pencil Rubbing	uction Form f Station:		ed ⊡S ed ⊡S	ubmittec iubmittec iubmittec		1	Checked By:
Weather ata File Nam Standard NGS	e(s): 6 Format = aaaa	addds.xxx)	cox=file depe	indant extension		Visibility Obstru Photographs of	uction Form f Station: of Mark:	<ul> <li>Attache</li> <li>Attache</li> </ul>	ed ⊡S ed ⊡S ed	Submitted	d earlier	1	
Weather ata File Nam Standard NGS here aaaa=4-Char Table of	<b>e(s):</b> 6 Format = aaaa acter ID, ddd=Day o	addds.xxx) FYear, s=Session ID, 7	cox=file depe V			Visibility Obstru Photographs o Pencil Rubbing	uction Form f Station: of Mark:	☐ Attache ☐ Attache ☐ Attache	ed ⊡S ed ⊡S ed COVE	submitted submitted	d earlier d earlier		BY:
Weather ata File Nam Standard NGS	e(s): S Format ≕ aaaa acter ID, ddd=Day o CODE	addds.xxx) Year, s=Session ID, y PROBLEM	∞≔file depe V Good,	ISIBILITY	N	Visibility Obstru Photographs o Pencil Rubbing	rction Form f Station: of Mark: RE 80° F	CLOUD	ed 🗆 S ed 🗇 S ed COVE	submitted submitted R %	d earlier d earlier Calm, u	WIND	BY: h (8km/h)

A CANADA ST		Designati	on: (	check	applicable:	_FBN_	_ CBN_	_ PAC_ S	АС 🗶 ВМ	)	Station F	PID, if an	y:	Date	e (UTC):		
GPS DPARTIO		GPS	64	AZ.	<u>MK</u>						AD	792	26		<u>)9-0</u>		-06
OBSERVATIC	N Genera	I Location:					Airport	ID, if any:			Station 4	-Charac	ter ID:	Day	of Year	:	
April: 16, 200	3 LON	EPA	LM	HE	AD												
Project Name:							Project	Number: / GPS-	078.00	08	Station S	Serial # (	SSN):	Ses	sion ID:(	` <b>`</b>	
	MONITO	RING													TE .		
o '	083 Latitude	"		0	3 Longitude	и		3 Ellipsoidal ーつノ	Height	ers	Agency I						
26 10					7 26.37	534	NAVD	88 Orthome	tric Ht.		Operator	Full Na	ne: <b>JA</b>	50N	' CAM	PBE	51L
Observation Se Sched. Start	<u>Ssion Times (</u> <u>30</u> Stop	3:30			al= <u>15</u> Seco	onds	GEOI	<b>2 - 72</b> 199 Geoid H	37 mete Teight	ers	Phone #	(561	) 627	7-5	5200	>	
Actual Start 🖉	2:17 Stop	3:30		Elevat Mask :	ion = <u>10</u> Deg	rees			67met	ers	e-mail ac	ddress:					
Receiver Br	and & Mod	el:		Ante	nna Code <sup>;</sup>	-					Antenna p Antenna p			on? (			rcle or No
TKIML	BLE TS	CE BR			TR	IMB	LE	5800			Antenna o	priented to	true Nor		(N) N)	-lf	fno,
P/N: 4518				₽/N· •	53620	-66	,				Weather of Antenna g				N) N)	exp	olain "
S/N: 0002	9497			S/N:	4450/4 Length, met	140	ク				Antenna r				(Y/Q)	lf y	ves,
Firmware Vers			l								Eccentric Any obstru	occupatio	on (>0.5 n hove 10°?	nm)?			cribe. se
CamCorder Batte	······			Vehicle i	is Parked 20						Radio inte	erference	source n	earby	(Y 10)	Vis.	form
Tripod or Ar Fixed-Leg Tripod, Brand & Model	Collapsible	e-leg tripod		ount	** A	NTE	ENN/	A HEIG	<b>;HT</b> **	k	Before S Meter		egins: eet		fter Sessi Meters	ion En Fe	
P/N: S/N:	/ - 64				A= Datu	m point	to Top of	Tripod (Tri	pod Height							ĺ	
Last Adjustmer	nt date:	1/A									[						
Psychromet			& Mode	l:	<b>B</b> =Addit	ionai off	set to AR	P if any (Trib	rach/Space	∋r)							
P/N;					H= Ante		•		Doint /AD	D)	2.057		75		~4	1	75
S/N: Last Calibration	ar abaals Dat	ka.					x (0.304	na Reference	Point (AR	P)	Note &/or						10
Last Calibration	TO CHECK Da	IC.			Height E	intered	Into Ree	ceiver = <u>2.(</u>	<u>0574</u> me	ters.	Be Very I	Explicit	as to wh	iere a	nd how f	Measu	ired!
Barometer (	if used) Bra	and &	Weat		Weather	TI	ime	Dry-Bu	b Temp		WetBulb	Temp	Rel.	%	Atm,	Press	ure
Model:			Dat	_	Codes		ITC)	Fahrenhe	it Celsius	!	Fahrenheit	Celsius	Humi	dity	inches	Hg mi	illibar
S/N:			Befo	re (	00110	2:	16	-		_						<u> </u>	
			Mido	lle d	0110	2!	40								- 		
			Afte	er (	00110	3.	30										
Remarks, C	omments o	on Proble	ems, S	ketch	es, Pencil	Rubb	oing, et	C:									
Weather	codes are req	uired. We	ather dat	a are c	optional but e	encoura	iged. */	Antenna coo	le comes	from	n ant_info f	ile furnis	hed by I	projec	t coordir	nator.	
Data File Nam	le(s):							pdated Statio isibility Obstru				Submit Submit			LOG C	) Heck By:	(ED
(Standard NGS where aaaa=4-Char				xx≕file de	ependant extensi	on		hotographs of encil Rubbing			I Attached I Attached	Submit	ted earlie	÷r			
Table of	CODE	PRO	BLEM		VISIBILITY		TE	MPERATU	RE		CLOUD CO	VER			WIND		
Weather	0	did no	t occur	Goo	od, over 15 m	niles	Nori	mal, 32° F-	80° F	C	lear, below	/ 20%	Calı	n, une	der 5mp	h (8km	n/h)
Codes	1	did c	occur	F	air, 7-15 mile	es	Hot,	over 80°F (	27 C)	Clo	oudy, 20%	to 70%	М	odera	ate, 5 to	15 mp	h
	2	- not	used -	Poo	or, under 7 m	iles	Cold,	below 32° I	= (0 C)	Ov	ercast, ove	er 70%	Stron	ig, ove	er15 mpl	h (24k	:m/h)
Examples:	00000 = No	problem,	good vis	ibility, r	normal temp	, clear,	calm wi	nd 12	2121 = Pi	roble	ems, poor	visibility,	hot, ov	ercas	t, mode	rate w	<i>i</i> nd

and the second s	Station I	Designatio	n: (che	eck applic	able:	_FBN_	_CBN_	_ PAC_ S		A)	Station F	PID, if an	ıy:	Dat	e (UTC):	
GPS DOAD IC		501	<u></u>								AJ	65	30	0	9-0	76-06
	General	Location:					Airport	ID, if any:			Station 4	l-Charac	ter ID:	Day	of Year	:
April 16, 200	3 NO	<u>RTH (</u>	<u>0FLC</u>	<u>ONE</u>	PAL	<u>.</u> M						50				
Project Name:							Project	Number: GPS-	1078.0	008	Station S	Serial # (	SSN):	Ses		(A,B,C etc)
	MONIT	<u>ORIN (</u>											A		10	•••
0 '	D83 Latitude		0	D83 Lon	-	u	NAD8	3 Ellipsoida	-	ters						ER INC.
26 15			80	49	48	<b>.</b>	NAVD	88 Orthome	etric Ht.		Operator	r Full Na	me: JA	SON	V CA	MPBELL
Observation S Sched. Start	<b>2</b> ,45 Stop	1:45	Inte	och erval=	5 Seco	onds	GEOI	<b>7. 6</b> D99 Geoid I	93 me	ters	Phone #	:(561	627	-5:	200	
Actual Start			Ele Ma	evation ask = <u>/</u>	<u>O</u> Deg	rees	0201	-24.7	, r	ters	e-mail ad	ddress:				
Receiver Br	and & Mode	ہے:اد	Ar	ntenna							Antenna p Antenna p			on?		Circle Yes or No
TRIME	ONTROLL	ĒR			$\tau$	RIM	BLE	5800	)		Antenna	oriented to	o true Noi	rth?	<b>(2</b> /N)	-lf no,
P/N: 4518:			P/	<sub>N:</sub> 53	620	-66	•				Weather of Antenna g			1ant. ? (	<b>(</b> N) (N)	explain "
S/N: 000 2	9497		S/N	N: 44	5014	4140	00				Antenna r	radome u	sed?		(Y 🔞	If yes,
Firmware Vers	-			able Leng			<	on) from anteni			Eccentric Any obstr					describe. Use
CamCorder Batte	ary, 1112V DC, 11	110V AC, 🗇 (	Other Veh	hicle is Park	ed <u>70</u>	meters	<u>) (</u> direction	on) from anten	na.		Radio inte					Vis. form
□ Fixed-Leg Tripod Brand & Model		leg tripod			** A	NTE	ENN/	A HEIG	SHT *	*	Before S Meter		egins: eet		fter Sess Meters	ion Ends: Feet
P/N: S/N:	FLT	•				m point t	o Top of	Tripod (Tri	ined Heigh		1					
Last Adjustme	nt date:				Dalu	in point e	0 100 0	mpod (m	pou neigi	н.) —————	<u> </u>					
Psychromet	ter (if used)	N/A Brand &	Model:		<b>3</b> ≕Additi	ional offs	et to AR	P if any (Trib	rach/Spac	er)						
P/N:			~			nna Heig	-		<b>.</b>		1000				a me	1 - ~
S/N:	an aba als Date			<u> </u>				na Reference	9 Point (Al	<b>R</b> P)	1.8959		22		<u>4.59</u>	6.22
Last Calibration	n of check Date	5.		H	leight E	= Feet x intered I	into Re	ceiver = <u>1.2</u>	9259m	eters.	Note &/or . Be Very I	Explicit	as to wh	isuai iere a	nd how l	ns. Measured!
Barometer (	(if used) Bra	nd &	Weather			Tir	ne	Drv-Bu	lb Temp		WetBulb	Temp	Rel.	%	Atm.	Pressure
Model:			Data	Coc	tes	(Ú1			it Celsius	3	Fahrenheit	Celsius	Humi	dity	inches	Hg millibar
S/N:			Before	00/	00	12:	40									` ,
			Middle	00,	110	1:0	20			·						-
			After	00	10	1:4	45					÷.,			ĺ,	
Remarks, C	comments o	n Problei	ms, Sket					C:	•••••		·····	<b>.</b>	<b>.</b>			
							-									
Weather	codes are requ	ired. Weat	ther data a	re option	al but e	ncourag	ged. */	Antenna co	de comes	s fron	n ant_info f	ile furnis	hed by p	orojec	t coordi	nator.
Data File Nam	10(s):							pdated Statio sibility Obstru				<ul> <li>Submit</li> <li>Submit</li> </ul>				HECKED BY:
	S Format = aaa racter ID, ddd=Day o			île dependa	nt extensio	on		notographs o encil Rubbing			D Attached D Attached	🗆 Submi	tted earlie	۹Ľ		
Table of	CODE	PROBL	LEM	VISI	BILITY		TE	MPERATU	RE		CLOUD CO	VER			WIND	
Weather	0	did not o	occur (	Good, ov	er 15 m	niles	Norr	mal, 32° F-	80° F	C	Clear, below	20%	Calr	n, und	der 5mp	h (8km/h)
Codes	1	did oc	cur	Fair, 7-	15 mile	s	Hot, d	over 80°F (	27 C)	Cle	oudy, 20%	to 70%	М	odera	ite, 5 to	15 mph
	2	- not us	sed -	Poor, und	der 7 mi	iles	Cold,	below 32°	F (0 C)	0	vercast, ove	er 70%	Stron	g, ove	er15 mp	h (24km/h)
Examples:	00000 = No	problem, g	ood visibilii	ty, norma	il temp,	clear, c	calm wir	nd 1:	2121 = F	Proble	ems, poor	visibility,	hot, ov	ercas	t, mode	rate wind

AND MEDICAL	Station I	Designation:	(checl	k applicable:	FBN_CBN_	PACS	АС <b>Д</b> ВМ)	Station	PID, if an	ıy:	Date (UTC)	:
GPS DORP IIC		501						AJ	65:	30	09-0	16-06
OBSERVATIO	General	Location:			Airport	ID, if any:		Station	4-Charac	ter ID:	Day of Year	r:
April. 16, 200	3 NOR	THOF	LONI	E PALM	·				50	<u> </u>		
Project Name:	<b>-</b> • •				Project	t Number: GPS-	078.00	Station Station	Serial # (	SSN):	Session ID:	
	D MONI	<u>NAIXOTI</u>									10	
o '	D83 Latitude	14	•	83 Longitude	"   NAD8	3 Ellipsoida	l Height meter					ER INC.
26 15				<u>19 48 </u>		088 Orthome	etr <u>ic</u> Ht.	Operato	r Full Na	<sup>me:</sup> JA	SON C	AMPBE
Observation S Sched. Start	1.15 Stop	<u>5.15</u>		val= <u>15</u> Seco	nds GEOU	<b>7. (</b> D99 Geoid I	93meter	<sup>rs</sup> Phone #	::( <b>561</b>	) 627	-5200	<b>}</b>
Actual Start	ioStop_	5:15	Eleva Mask	ation k = <u>10</u> Degr			.76 <sup>meter</sup>	rs e-mail a	ddress:			
-	BLE TSO CONTRO	E			RIMBL		00	Antenna Antenna Weather	plumb afte oriented to observed		? (A) N) h? (A) N) a ht. (A) N)	Circle Yes or No -If no, explain
P/N: 4518	5-10		P/N:	53620	-60 11400			Antenna	ground pla	ane used?	@/ N)	
S/N: 0002 Firmware Vers		400400 - 700-		445014 le Length, mete				Eccentric	•	-	m)? (Y	if yes, describe. Use
CamCorder Batte					neters(direct	ion) from antenr	18.				arby (Y 🕅	Vis. form
□ Fixed-Leg Tripod Brand & Model		-leg tripod 🛛 Fix		** A	NTENN	A HEIC	SHT **	Before S Mete	Session B rs F	egins: eet	After Sess Meters	<b>sion Ends:</b> Feet
P/N: S/N: Last Adjustme		κ/ → ,		A= Datum	n point to Top o	f Tripod (Tri	pod Height)					
		N/A		BEAdditic	onal offset to AF	2P if any /Trib	rech/Snacer					
Psychrome	ter (if used)	Brand & Mo	odel:					′ <b> </b>				
P/N:					na Height 🛛 🗕 🖌 n Point to Anter		Point /ARP	1000		725	/. 8974	ברר ג
S/N: Last Calibratio	n or check Date	<del>.</del>			Feet x (0.304						zual conditio	
<				Height Er	ntered Into Re	ceiver = $h$	8974 mete	rs. Be Very	Explicit	as to whe	re and how	Measured!
Barometer ( Model:	(if used) Bra		eather Data	Weather Codes	Time (UTC)		b Temp it Celsius	WetBulb Fahrenheit		Rel. % Humidi		. Pressure Hg millibar
			efore	00110	4:00							
S/N:		N	liddle	00110	4:32		·			ľ	2	
			After							ţ.	· ·	
Remarks, C	ommente o			<i>OOIIO</i>		to:		I				
			,									
Weather	codes are requ	uired. Weather	r data are	optional but er	ncouraged. *	Antenna co	te comes fr	rom ant_info	file furnis	shed by pr	roject coordi	nator.
Data File Nam	•••				l v	isibility Obstru	uction Form:	1:  Attached Attached	🗇 Submi	tted earlier tted earlier	· [	Checked By:
(Standard NGS where aaaa=4-Cha	S Format = aaa racter ID, ddd=Day	addds.xxx) of Year, s=Session	ID, xxx=file	dependant extensio		hotographs o encil Rubbing		Attached     Attached	U Supmi	rien eaulet		
Table of	CODE	PROBLEM	<u>n</u>	VISIBILITY	TE		RE	CLOUD CO	OVER		WIND	
Weather	0	did not occ	ur Go	ood, over 15 mi	les Nor	mal, 32° F-	80° F	Clear, below	v 20%	Calm	, under 5mp	h (8km/h)
Codes	1	did occur		Fair, 7-15 mile:	s Hot,	over 80°F (	27 C)	Cloudy, 20%	to 70%	Мо	derate, 5 to	15 mph
	2	- not used	- Po	por, under 7 mi	les Cold,	below 32°	= (0 C)	Overcast, ov	er 70%	Strong	, over15 mp	h (24km/h)
Examples:	00000 = No	problem, good	l visibility,	, normal temp,	clear, calm wi	ind 1:	2121 = Pro	blems, poor	visibility,	hot, ove	rcast, mode	erate wind

	1	Designation:	(check	applicable:	_FBN_	_CBN	PACS	AC <u>X</u> BM	/)	Station P	ID, if an	iy:	,	(UTC):		
GPS <sup>IIIIAA</sup> IIO		497													,2006	
OBSENVATIO		Location: $\mathcal{Q}_{1} \sim \mathcal{P}_{2}$	5-1			Airport	ID, if any:			Station 4-	Charac	ter ID:	Day	of Year	:	
April 16, 200	3 240	RISE	PL.			Draiaa	t Number: /	078		Station S	orial # (	COND:	Seco	ion ID:	(A.D.C. ata)	
Project Name:	SFW	1MD	MONIT	ORING (	weil	-	GPS-								(A,B,C etc)	
NAE o '	083 Latitude	"	NAD8	33 Longitude	"	NAD8	3 Ellipsoida	-	ters	Agency F	ull Nam	ne: N	ICK	MI	LERIN	
Observation Sc			Epoc			NAVE	088 Orthome	etric Ht.		Operator	Full Na	me: 🏌	on c	110		
Observation Se Sched. Start //	<u>: 00</u> Stop	12:15	Interv Eleva	/al= <u>/</u> 5 Sec	onds	GEOI	D99 Geoid I		ters	Phone #.	( 56)	102	7-	520	20	
Actual Start 10	):2.( Stop	11:45		= <u>/0</u> Deg	grees			me	ters	e-mail ad	dress:	into	ex.	UCKP	NLLERIN	f.cc
Receiver Br	and & Mode	əl:	Ante	enna Code	*, Bra	nd & M	Nodel:			Antenna p Antenna p	lumb bef	ore sessi	on? (	(V/N) (V/N)	Circle Yes or No	
TRIMB	LE RE	3	TI	REMBLE	R	8				Antenna o Weather o	riented to	o true Nor	th? 🤅	()/N) ()/N)	-If no, explain	
P/N:45145 S/N:43121	16			17165 121910		Č				Antenna g			? <b>(</b>	ĎN)	explain "	
S/N: 43727 Firmware Versi	979 <u>2</u>		S/N: Cable	マメタリン e Length, mel	) i Q+ iere: - A					Antenna ra			(	Y IO	If yes,	
CamCorder Batte		110V AC: COlbo		e is Parked <u>/</u> 5			ion) from enter	na		Eccentric of Any obstru	ictions al	bove 10°?	? (	(Y /) (Y /)	describe. Use	
				<u> </u>						Radio inter					Vis. form	ļ
□ Fixed-Leg Tripod,				│ ** A	NTE	ENN	A HEIG	SHT *	*	Before Se Meters		egins: eet		ter Sess Aeters	ion Ends: Feet	l
Brand & Model P/N:	d-Leg Tripod, BY Collapsible-leg tripod B Fixed Mount d & Model: FLORIDA LEVEL & TRAIUSET A= Datum point to Top of Tripod (Tripod Height)										Т			<u> </u>		
S/N: Last Adjustmer	Adjustment date:															
Psychromet	<u></u>	Brand & Mo	odel.	<b>B=</b> Addit	ional off	fset to AF	RP if any (Trib	rach/Spac	xer)							
r oyomomor			0401.	H= Ante	onna Hei	ight = /	4 + B									
P/N: S/N:				= Datu	um Point	to Anter	nna Reference	Point (AF	RP)		5.	94			5.94	ĺ
Last Calibration	n or check Date	e:		Meters Height E			48) :ceiver =	me	eters.	Note &/or Be Very E						
Barometer (	if used) Bra	ind & W	eather	Weather	Т	ime	Dry-Bu	b Temp	T	WetBulb T		Rel			Pressure	
Model:			Data	Codes		TC)	Fahrenhe	it Celsius	3 1	Fahrenheit	Celsius	Humid	dity	inches	Hg millibar	
S/N:				01000	10:2							s				ļ
				00010	71;7		· · ·	·								1
			After	00010	$H^{:L}$	15					-				· · · · ·	
Remarks, C	omments o	n Problems	, Sketch	nes, Pencil	Rubb	oing, e	tc:									
Weather	codes are requ	uired. Weather	r data are	optional but	ncoura	* hap	Antenna co	le comes	s from	n ant info fi	le furnie	shed by r	orniect	t coordi	nator	
Data File Nam	·					T	pdated Statio	n Descript	tion: 🗆	Attached (	J Submi	tted earlie	er	·	HECKED	
(Standard NGS	S Format = aaa		ID. xxx=file 4	dependant extens	ion	V   F	isibility Obstruction Notographs o Pencil Rubbing	uction Forr f Station:	m: [	3 Attached (	🗇 Submi	tted earlie tted earlie	ər 📔		BY:	
Table of	CODE	PROBLEM		VISIBILITY		T	EMPERATU	RE		CLOUD CO	VER			WIND	- <u> </u>	1
Weather	0	did not occ	ur Go	od, over 15 n	niles	No	mal, 32º F-	80° F	С	lear, below	20%	Cair	n, und	ier 5mp	h (8km/h)	1
Codes	1	did occur	,	Fair, 7-15 mile	es	Hot,	over 80°F (	27 C)	Clo	oudy, 20% t	o 70%	м	oderat	te, 5 to	15 mph	1
	2	- not used	- Po	or, under 7 m	niles	Cold,	below 32° l	= (0 C)	0	vercast, ove	r 70%	Stron	g, ove	er15 mp	h (24km/h)	1
Examples:	00000 = No	problem, good	l visibility,	normal temp	, clear,	calm w	ind 12	2121 = P	roble	ems, poor v	visibility,	hot, ov	ercast	t, mode	erate wind	1

Γ

GPSTIMAN		esignation: 1977	(chec	k applicable:_	_ FBN CE	BN_PAC_S	ас <u>X</u> вм)	Station	PID, if an	iy:	Date (UTC)	: PT 2006
OBSERVATIO	a c —			_	Airp	ort ID, if any:		Station	4-Charac	ter ID:	Day of Yea	
LOG April, 16,, 200	3 SUN	RISE, 1	ĊĿ.		F	···· <b>,</b> ··· <b>,</b>						-
Project Name:		10406-7 1	<u>.</u>	<u>.</u>	Proj	ect Number:	1078	Station	Serial # (	SSN):	Session ID:	(A,B,C etc)
	SEWMD	MONI	10121	NG WE	us	GPS-						
NAI o '	083 Latitude		NAD	83 Longitude	" NA	D83 Ellipsoida		Agency	Full Nam	ne:	ER IN	<i>c</i> .
					NA	VD88 Orthom	mete etric Ht.		r Cull No	ma	ene fre	
Observation Se Sched. Start /	ession Times (U <u>4:30</u> Stop	I <b>TC):</b> ′ 5ି≑ିତ	Epoc Inter	val= /S Sec	onds		mete	ers Phone #	ص جي ( ج ج) #	) 44 J	201 (° 103 1 - 5 200	~ '
_	1:22 Stop 1		Elev Masi	ation k = _/	grees	OID99 Geoid	mete					Ca Mere
Receiver Br	and & Mode	l:	Ant	enna Code	*, Brand &	& Model:		Antenna	plumb bef	ore sessior	n? (Ý͡∕/N)	Circle
TRIMO	LE RR		7	RIMAL	E R8			Antenna	oriented to	er session? true North	1? (Y/N)	Yes or No -If no,
P/N: 45145	-46		P/N	45145	City.					at antenna ane used?	tht. (Ŷ/)N) (Ŷ͡/)N)	explain "
S/N: 4312 Firmware Vers			S/N:	USI222 le Length, mel	12.20			Antenna	radome u	sed?	(Y / Ń)	lf yes,
	ny, ⊡ 12V DC, ⊡ 1	10V AC C Other		•	-	rection) from anten	na			on (>0.5 mr bove 10°?	m)? (Y /⁄Ń)) (Y /⁄Ŋ)	describe. Use
	ntenna Moun								erference Session B		After Ses	Vis. form
Fixed-Leg Tripod Brand & Model	, ⊡`Çollapsible-l	leg tripod D Fix		A	NIEN	NA HEIO	5HI ~~	Mete		eet	Meters	Feet
P/N:	FLORIDA	LEVEL -	ifint)		na naint ta Ta	p of Tripod (Tr	inod Llainhi					
S/N: Last Adjustmer	nt date:			A-Dait	in point to 10	portripod (in	ipoa rielgnij					
Psychromet	er (if used) E	Brand & Mo	odel:	- <b>B</b> =Addit	ional offset to	ARP if any (Trik	orach/Space	r)				
P/N:					onna Height				5	;94		5.94
S/N:						tenna Referenc	e Point (ARI					
Last Calibration	n or check Date	:			= Feet x (0.3 Entered Into	3048) Receiver =	met	ers. Be Very			sual condition re and how	
	if used) Brar		eather	Weather	Time	Dry-Bu	lb Temp	WetBulb	Temp	Rel. %	Atm	Pressure
Model:			Data	Codes	(UTC)	Fahrenhe	it Celsius	Fahrenheit	Celsius	Humidi	ty inches	Hg millibar
S/N:		B	efore	00320	14:25		ļ					
		M	liddle	cc0 0	15:00							
		F	After	00010	15:30							
Remarks, C	omments on	Problems	, Sketc	hes, Pencil	Rubbing,	etc:						
Maatha-	codes are requi	irad Maatha-	data ara	ontional but a	nournand	*Antonno co	de comos	from ont info	filo furni-	had he	night acard	nator
Data File Nam			uala ale					on:   Attached		tted earlier		CHECKED
(Standard NGS	S Format = aaaa racter ID, ddd=Day of		ID vvv=filo	dependent evtere	ion	Visibility Obstr Photographs o Pencil Rubbin	uction Form of Station:	☐ Attached ☐ Attached ☐ Attached	🗆 Submi	tted earlier tted earlier		BY:
Table of	CODE	PROBLEN	· ·	VISIBILITY		TEMPERATU	RE	CLOUD CO	OVER	Γ	WIND	
Weather	0	did not occi	ur Go	ood, over 15 n	niles I	Normal, 32° F-	80° F	Clear, below	v 20%	Calm	, under 5mp	h (8km/h)
Codes	1	did occur		Fair, 7-15 mile	es H	ot, over 80°F	(27 C)	Cloudy, 20%	to 70%	Мо	derate, 5 to	15 mph
	2	- not used	- P(	oor, under 7 m	niles Co	ld, below 32°	F (0 C)	Overcast, ov	er 70%	Strong	, over15 mp	h (24km/h)
Examples:	00000 = No p	problem, good	l visibilitv	, normal temp	, clear. calm	wind 1	2121 = Pr	oblems, poor	visibilitv.			

GPS III PAR	Station Designation: (check applicable:FBNCBNPACSAC //BM)										Station PID, if any: $AO 8127$			Date (UTC): 6 Sept, 2006						
OBSERVATIO		General Location: Airport ID, if any:									Station 4-Character ID:			Day of Year:						
LOG April 16, 200	3 Bro	Broward +2																		
Project Name:					رمسر، ا		Projec	t Number: 10 GPS-	278		Station Se	rial # (	SSN):	Session ID:(A,B,C etc)			]			
	NO MO	וואנ									<u> </u>						4			
2.6 // 21.6/7 010 .5/ 7/,9/3/ NAVD88 Orthometric Ht.											Agency Fi Operator F	Agency Full Name: NICL MILLER WC I Operator Full Name: Josh Szuszawik I								
Observation Session Times (UTC):       Epoch         Sched. Start 12: 30       Stop 13:45         Elevation       Seconds         Elevation       GEOID99 Geoid Height											Phone #: (561) 627-5200									
Actual Start $12:27$ Stop $13:45$ Mask = 10 Degrees -24.92 meters												e-mail address: WFOP NICKMCLER INC.								
Receiver Brand & Model: Antenna Code*, Brand & Model:											Anterna plumb before session? (X) N) Circle Anterna plumb after session? (Y)/ N) Yes or No									
TRIMBLE RO TRIMBLE RO											Antenna oriented to true North? $(0/N)$ -If no, Weather observed at antenna ht. $(0/N)$ explain									
P/N: 45705 46										Antenna ground plane used?										
S/N: 4317_119192 Firmware Version: Cable Length, meters: Zavi										Antenna radome used? (Y / 1) If yes, Eccentric occupation (>0.5 mm)? (Y / 1) describe.										
□ Cable Length, meters: Zwi □ Cable Length, meters: Zwi direction) from antenna.										Any obstruc	tions at	bove 10°1	?	(Y/)())	describe. Use					
											Radio interf			· ·		Vis. form	4			
Tripod or Ai	Collapsible	leg tripod	Fixed Mount		** A	NTE	NN	A HEIG	iht *		Meters		eet		Meters	Feet				
Brand & Model P/N:	FLORIDA	LEVEL	4-TRAN	ĿΠ	<b>A</b>							T	_				1			
S/N: Last Adjustme	nt date:				A= Datu	um point to	о Тор о	f Tripod (Tri	pod Heigh	nt)										
B=Additional offset to ARP if any (Tribrach/Spacer)																				
D/NI-						enna Heig						5	5			5-22-				
P/N: S/N:											875	<u> </u>		5.875	4					
Last Calibratio	n or check Date	e:		Meters = Feet x (0.3048) Height Entered Into Receiver = meters.							Note &/or sketch ANY unusual conditions. . Be Very Explicit as to where and how Measured!									
Barometer ( Model:	Weather Data				ne īC)			з	WetBulb Temp Fahrenheit Celsius					Atm. Pressure ches Hg millibar						
S/N:		ſ	Before	00	010	12:2	27										]			
3/N.	Middle	dle 00010 1:1													]					
	After	ter 00010 1:4			5			Т	Ī		[				1					
Remarks, C	omments o	n Proble	ms. Sket					tc:			╺┉╴┈╶╸╸						1			
, -			,		,															
																	1			
····	codes are requ	uired. Wea	ther data a	re opti	ional but e	encourag					m ant_info file			<u> </u>			4			
Data File Nam	ie(s):						_   v	Ipdated Station	iction Form	<b>m:</b> (	Attached	Submit	tted earlie	ər		HECKED BY:				
(Standard NGS where aaaa=4-Cha	S Format = aaa racter ID, ddd=Day			ile depe	ndant extens	ion		Photographs of Pencil Rubbing			Attached     Attached     Attached	Submit	tted earlie	ər	·		1			
Table of	CODE	PROB		VISIBILITY			TEMPERATURE				CLOUD COV	WIND				1				
Weather	0	did not	occur	Good, over 15 miles			Normal, 32° F- 80° F				Clear, below 2	Calm, under 5mph (8km/h)				1				
Codes	1	did oo	ccur	Fair	, 7-15 mile	es	Hot, over 80°F (27 C) C			loudy, 20% to	м	Moderate, 5 to 15 mph								
										vercast, over	vercast, over 70% Strong, over15 mph (24km/h)									
Examples:	00000 = No	problem, g	good visibili	ty, nor	mal temp	, clear, c	alm w	ind 12	121 = P	Probl	lems, poor vi	sibility,	hot, ov	ercas	st, mode	erate wind	1			

,

GPSION		Station Designation:(check applicable: FBN_CBN_PAC_SAC $\chi$ BM) $\mathcal{N}$ $\mathcal{A}$									Station PID, if any: AD8/27				Date (UTC): 6 SEPT 2006				
OBSERVATIO	N General	General Location: Airport ID, if any:										Station 4-Character ID:			Day of Year:				
April 16, 200	3 BRO	WART	>, (	<u></u>															
Project Name: SCWM	D MONI	TORIN	10 U	) El c			Project	Number: GPS-	1078	5	Station	Serial # (	SSN):	Ses	sion ID:(	A,B,C etc)			
NAI 26° 19'	083 Latitude 29. 618	"			Longitude ' 47,479	5 <b>0</b> "	~ <sup>r</sup>	3  Ellipsoida 21.05	met	ers	N/20	Full Nam	ncenje mov						
Observation Se Sched. Start _/	6:15 Stop	17:15	. Ir	poch       3,87/       meters         nterval=/5       Seconds       GEOID99       Geoid Height						ers F	- 1987 - Seconder 3 Phone #: (5は-) - らえつ - 5 こうつ								
												e-mail address: INFOC NICKMILLECINC CON							
Receiver Br		əl:	A	Antenr	na Code	*, Brai	nd & N	lodel:				plumb bef plumb afte			(Y) N) (Y) N)	Circle Yes or No			
7 K 105BL	fe, -			- de de ch								Antenna oriented to true North? (Y/N) -If no, Weather observed at antenna ht. (Y/N) explain Antenna ground plane used? (Y/N)							
S/N: 4312.1	19192		s	P/N: 4574546 S/N: 4372-119792								Antenna radome used? (Y (N) If yes,							
CamCorder Batte		110V AC,		Cable Length, meters: $2M$ Vehicle is Parked $2O$ meters $M$ (direction) from antenna.								occupations al	nm)?	(Y (N) (Y (N))	describe. Use				
Tripod or Antenna Mount: Check one: Fixed-Leg Tripod, Scollapsible-leg tripod, Fixed Mount ** ANTENNA HEIGHT **												ession B		nearby (Y (N)) Vis. form After Session Ends: Meters Feet					
Brand & Model: P/N: S/N: You King Control of Control Area Area Area Area Area Area Area Area																			
S/N:	lesk1enn – ∂ nt date:	9 1 I C		17	A= Datu	m point i	to Top of	Tripod (Tri	pod Height	)									
B=Additional offset to ARP if any (Tribrach/Spacer)										er)									
H= Antenna Height = A + B												1	275 <sup>°</sup>			6.075			
P/N: = Datum Point to Antenna Reference Point (ARP) S/N: Last Calibration or check Date: Meters = Feet x (0.3048)											ata Ria				a analiti an	<u> </u>			
		<b>.</b>						ceiver =	me						condition nd how N	Aeasured!			
Barometer ( Model:	if used) Bra	Weathe Data		Veather Codes		ime Dry-Bulb Temp JTC) Fahrenheit Celsius				WetBulb Temp Fahrenheit Celsius			Rel. % Atm. Pr Humidity inches Hg						
S/N:					ciro	16'	:15			Τ									
S/N.	Middle	<b>)</b>	0110	16	45														
		After		010		15													
Remarks, C	omments o	n Proble	ems, Ske					C:											
Weather	codes are requ	uired. Wea	ather data	are opt	tional but e	ncoura	ged. */	Antenna coo	le comes	from a	nt_info	file furnis	hed by p	projec	t coordin:	ator.			
Data File Nam	e(s):			·			UI Vi Pi	odated Station sibility Obstru notographs of	n Description Intion Form	on:⊡At n:⊡At ⊡At	tached tached tached	<ul> <li>Submit</li> <li>Submit</li> <li>Submit</li> </ul>	tted earlie	er	LOG C	HECKED 3Y:			
where aaaa=4-Character ID, ddd=Day of Year, s=Session ID, xxx=file dependant extension Pencil Rubbing of Mark:   Attached																			
Table of	CODE	PROB						MPERATU					WIND						
Weather	0	did not			, over 15 miles Normal, 32° F- 80° F						r, belov			Calm, under 5mph (8km/h)					
Codes	1	ccur		, 7-15 mile						loudy, 20% to 70%			Moderate, 5 to 15 mph						
												15 mph (24km/h)							
Examples:	00000 = No	problem, g	to problem, good visibility, normal temp, clear, calm wind 12121 = Problems, poor visibility, hot, overcast, moderate wind											rate wind					

## SURVEYOR'S CERTIFICATION

In my professional opinion, this report of survey meets applicable portions of the Minimum Technical Standards set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 61-G17, Florida Administrative Code. This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

NICK MILLER, INC. DBPR Authorization No. 4318

September 6<sup>th</sup>, 2006

Date of Survey

By:

Stephen M. Gordon, PSM Professional Surveyor and Mapper State of Florida Certificate No. 5974

## U.S DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL GEODETIC SURVEY

> Charles W. Challstrom Director

PROJECT REPORT GPS-Derived Orthometric Heights and Mark Setting

Summer 2006

Ronnie L. Taylor National Geodetic Survey, NOAA National Ocean Service Advisor, Florida

#### PROJECT TITLE

#### Hydrology - Everglades Wells

**ESTABLISH BENCH MARKS NEAR WELLS IN THE EVERGLADES** STARTING HEIGHT IS BASED ON NAVD 88 HEIGHTS.

JOB CODE AA

## **PROJECT REPORT**

## I. INTRODUCTION

## A. Authority

Bench Mark Setting and finding GPS-Derived Orthometric Heights was authorized by a contract between the South Florida Water Management District and Nick Miller Incorporated.

## B. Purpose

The purpose of this leveling project was to establish precise NAVD 88 heights near existing Ground Water Monitoring Wells for use by the South Florida Water Management District and the citizens of the State of Florida.

## II. <u>PROJECT AREA</u>

## A. Locality

This project is located in the Everglades of southern Florida.

## B. Terrain

The terrain is flat to rolling.

## C. Specifications

FGCS Specifications and Procedures to Incorporate Electronic Digital/Bar-Code Leveling Systems were followed.

## D. Monumentation

Monuments are 9/16" stainless steel rods driven to refusal with a PVC enclosure and an access cap. A magnetic device was either placed in or near the monuments. Please see descriptions for magnetic placements.

## E. Instrumentation

Trimble 4800, Trimble 5800 and Trimble R8 GPS receivers.

## III. <u>COMMENTS</u>

#### A. Reconnaissance

See the To-Reach Descriptions included, for a clear access to all stations.

## B. Specifications

There were no deviations from the NGS Guidelines for Establishing GPS-Derived Orthometric Heights.

## C. Problems

The Trimble 4800 GPS receiver malfunctioned after the first session of the second day. Only the first session was used from that receiver. J 502 had to be observed as control in place of TIEBACK AZ MK since another surveying firm was using that point at the time of our session. Also, Z 497 was used in the place of Y 497 do to an additional obstruction.

## IV. <u>Closures</u>

## A. Status

All records will be kept at Nick Miller, Inc. For information on these records please contact Stephen M. Gordon at (561)627-5200.

For question concerning the collection or processing of this data please call Ronnie L. Taylor or Randy Wegner at (850)245-2606.

## B. Attachments

The following are included in this package:

Disk containing the following data files is attached:

- Field Logs
- R-file
- G-file
- Serfil
- B-file
- D-file
- Minimally-constrained adjustment
- Constrained adjustment
- Minimally-constrained vertical adjustment
- Constrained vertical adjustment
- Final free adjustment
- Final B-file