FINAL DATA REPORT Rev. 2
GEOTECHNICAL EXPLORATION AND TESTING

TURKEY POINT COL PROJECT
FLORIDA CITY, FLORIDA

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VOLUME 1
Appendix A – Survey Report

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MACTEC Project No. 6468-07-1950

Prepared For:

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Subcontract No. 25409-102-HC4-CY00-00001

MACTEC ENGINEERING AND CONSULTING, INC.

SURVEYOR'S REPORT
OF

AS-BUILT SURVEY OF GEOTECHNICAL INVESTIGATION SITES
AT TURKEY POINT NUCLEAR PLANT, PROPOSED UNITS 6 AND 7
MIAMI-DADE COUNTY, FL
MACTEC Project number 6468-07-1950

As part of the project assignment MACTEC was responsible for the as-built locations of all geotechnical investigation sites at the Turkey Point Nuclear Plant, proposed Units 6&7, known as the Island Site. The geotechnical investigation sites consisted of soil boring sites, ground water observation sites, cone penetration test sites and test pits staked and drilled by MACTEC. This surveyor's report lists the geographical locations and elevations of the geotechnical investigation sites and provides information as to horizontal and vertical datum's, survey control points, and procedures and equipment utilized in the course of the survey.

Horizontal and Vertical Datums

The horizontal locations of all geotechnical investigation sites are relative to the North American Datum of 1983/ 1990 adjustment (NAD83/90) with the values expressed in Florida State Plane Coordinates (FSPC), Florida East, Zone 901, expressed in US feet.

The elevations of all of the geotechnical investigation sites are relative to the North American Vertical Datum of 1988 (NAVD88) expressed in US feet.

Primary Control from which As-built Survey is based

To support the needs of this assignment as well as establish survey control for future work at the Island Site, two (2) primary control stations were established in the course of this survey. The control stations, known as CRC1 and CRC2 are located immediately west of the Island Site on the west side of the perimeter canal and roadway. The control stations are poured-in-place concrete monuments with brass discs stamped "CRC1 2007" and "CRC2 2007" respectively.

Geographical positions for the primary control stations were established utilizing Global Positioning System (GPS) static measurement procedures. GPS observations were conducted using three Trimble Navigation, Ltd. dual-frequency receivers

(one model 5800 and two model 5700) on January 17-19, 2008. Observations were made to primary control stations CRC1 and CRC2 as well as to National Geodetic Survey (NGS) geodetic control stations "FIRE", "QUARRY_2" and "TURKEY POINT RM3" (go to www.ngs.noaa.gov for additional information regarding the NGS control stations). Measured vectors were processed daily and loop closures were performed for evaluation of data. After loop closures were performed, a free adjustment was made. A single point was held fixed in X, Y and Z coordinate values. Misclosures were calculated for each of the other control points and outliers flagged for further evaluation. Any suspect values were remeasured to ensure that any abnormalities were not caused by poor baseline data. Each point in the network was occupied multiple times during different satellite constellations. Vectors used in the final constrained adjustment are independent, non-trivial vectors. Network adjustments were conducted using GeoLab 2001.90.20.20.0 .

Elevations for the primary control stations were established by differential leveling from NGS benchmarks "Y 314, "A 316" and "LM 18 316 FPLCO" (go to www.ngs.noaa.gov for additional information regarding NGS benchmarks). A Zeiss DiNi21 Digital level with matching level rods was utilized for this assignment. The instrument was calibrated using the Kukkamaki Method prior to initiating the level runs. All level runs originated and closed on NGS benchmarks and utilized 3rd order leveling procedures. The data collected in the course of the level runs was reduced and adjusted utilizing STAR*LEV Adjustment software, Version 1.30 . Results yielded 3rd order accuracies.

The listing below provides geographic positions and elevations for the primary control stations utilized in the course of performing the As-built survey.

Primary Station	**FSPC Feet (NAD83/90)**		**Elevation Feet (NAVD88)**
	Northing	**Easting**	
CRC1	**398398.35**	**874595.10**	**4.58**
CRC2	**397319.37**	**874826.93**	**3.68**

Performing the As-built Survey

The As-built survey of the geotechnical investigation sites was made utilizing GPS technology operating in Real Time Kinematic (RTK) mode. Utilizing the above referenced primary control stations, a Trimble Navigation Ltd. Model 5700 GPS-RTK dual-frequency receiver system was used to collect the survey data. A base station with fixed height tripod was set on primary control station CRC2 as the basis for measurements. The rover unit, with fixed height bipod, was used to acquire the data by visiting each geotechnical investigation site. Before and after each measurement session a "check" measurement was made by the rover unit at primary control station CRC1 to verify the values being obtained in the measurement process.

A measurement was made at each geotechnical investigation site on two separate occasions as a quality control procedure. Acceptable measurements were averaged to develop final coordinate and elevation values.

Listed on Attachment A are the Florida State Plane Coordinates (North American Datum of 1983/Adjustment of 1990, Florida East, Zone 0901,US feet) and elevations (North American Vertical Datum 1988,US feet) for each geotechnical investigation site. The coordinates and elevations for the borings, cone penetration and test pits were measured at the center of the hole or pit. The coordinates and elevations for each observation well were measured at both the northeast corner of the concrete pad surrounding the well site as well as the top of the PVC pipe (north side of pipe with notch or mark) located inside the well casing. This survey is certified as meeting the project specification to locate the borings and other geotechnical exploration points to the nearest 0.5' horizontally and the vertical accuracy to the nearest 0.1'.

Surveyors Notes

1) Copies of this Surveyor's Report are not valid with out the signature and original embossed seal of the Florida Registered Land Surveyor in responsible charge.
2) Last date in field: June 24, 2008
3) Field Book : 978

For the Firm,
MACTEC Engineering and Consulting, Inc.

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Summary of Locations and Elevations of
Geotechnical Investigation Sites

surveys made between April 21, 2008 and June 24, 2008

State Plane Coordinates, North American Datum of 1983/ Adjustment of 1990, Florida East, Zone 0901, US Feet

Elevations (North American Vertical Datum of 1988, US Feet)

Name	Comments	Northing	Easting	Elevation
	Borings			
B - 601 (DH)		396967.9	876642.9	-1.4
B - 602		397019.6	876594.1	-1.4
B - 603		397018.4	876697.0	-1.4
B - 604 (DH)		396915.9	876591.6	-1.5
B - 605		396916.8	876694.1	-1.7
B - 606		396958.9	876738.0	-1.4
B - 607		396830.0	876644.2	-1.5
B - 608 (DH)		396829.5	876735.9	-1.5
B - 609		396762.5	876689.0	-1.5
B - 610 (DH)		397084.2	876644.4	-1.4
B - 611		397086.7	876735.0	-1.5
B - 612		397085.5	876869.1	-1.5
B - 613		397162.2	876809.4	-1.4
B - 614		397204.1	876870.7	-1.5
B - 615		397167.4	876761.8	-1.5
B - 616		397207.9	876723.7	-1.2
B - 617		397288.1	876721.7	-1.4
B - 618		397207.6	876643.1	-1.4
B - 619		397293.9	876653.7	-1.7
B - 620 (DH)		397394.9	876648.3	-1.5
B - 621		397367.6	876949.3	0.2
B - 622		397421.2	876810.7	0.2
B - 623		397422.6	876523.2	-1.3
B - 624		397327.1	876514.1	-1.4
B - 625		397106.5	876960.5	-1.4
B - 626		396874.5	876857.2	-1.6
B - 627		396835.2	876332.9	-1.3
B - 628		397072.9	876473.2	-1.5
B - 629		396971.9	876346.1	-1.1
B - 630		396871.5	876462.1	-1.5

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B - 631		396655.1	876514.1	-1.2
B - 632		396432.4	876737.0	-1.6
B - 633		396113.3	876993.9	-1.5
B - 634		395758.2	876677.2	-0.7
B - 635		395770.9	876798.2	-0.9
B - 636		395714.8	877193.2	-1.1
B - 637		395693.1	877310.3	-0.2
B - 639		396963.5	876998.2	-1.4
B - 640 (DHT)	**also known as C - 602 A**	397116.6	876528.3	-0.3
B - 701 (DH)		396976.1	875792.3	-1.1
B - 702		397017.9	875745.9	-1.2
B - 703		397018.1	875846.1	-1.3
B - 704 (DH)		396930.7	875741.7	-1.4
B - 704 G (DH)		396938.6	875749.0	-1.3
B - 705		396919.2	875846.4	-1.3
B - 706		396962.5	875885.3	-1.2
B - 707		396828.8	875790.8	-1.8
B - 708 (DH)		396829.7	875885.7	-1.4
B - 709		396760.5	875840.6	-1.3
B - 710 (DH)		397086.9	875792.9	-1.3
B - 710 (DH) R		397087.15	875781.85	-1.3
B - 710 G (DH)		397075.1	875792.2	-1.4
B - 711		397085.6	875884.8	-1.1
B - 712		397082.1	876022.1	-1.1
B - 713		397179.3	875959.0	-1.1
B - 714		397258.7	876020.6	-1.0
B - 715		397259.2	875908.5	-0.9
B - 716		397214.3	875872.7	-1.1
B - 717		397287.0	875873.1	-1.1
B - 718		397190.9	875792.6	-1.2
B - 719		397293.2	875791.3	-1.1
B - 720 (DH)		397396.7	875791.1	-0.9
B - 720 G (DH)		397385.2	875794.0	-1.1
B - 721		397338.0	876120.1	-1.5
B - 722		397434.2	875979.6	-1.0
B - 723		397421.2	875675.4	-1.0

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B - 724		397325.5	875663.2	-0.7
B - 725		397099.8	876111.2	-1.0
B - 726		396875.6	876003.9	-1.4
B - 727		397117.7	875666.1	-1.3
B - 728		397070.5	875620.1	-1.4
B - 729		396970.7	875493.4	-1.2
B - 730		396868.0	875621.0	-1.0
B - 731		396645.6	875423.1	-1.5
B - 732		396412.1	875682.4	-1.0
B - 733		396117.5	875897.5	-1.0
B - 734		395833.2	875546.3	-0.6
B - 735		395824.7	875689.4	-0.8
B - 736		395808.5	876107.1	-0.5
B - 737		395803.7	876237.8	-0.6
B - 738		397728.1	875607.3	0.1
B - 739		396962.9	876149.6	-1.6
B - 740 (DHT)	Top of PVC Pipe	397136.7	875842.04	0.5
B - 740 (DHT)	Ground adjacent to PVC Pipe	397137.16	875841.68	-0.8
B - 802		398817.1	876265.7	-1.5
B - 805		396883	877239.5	-1.6
B - 806		395288.3	877237.4	-0.4
B - 807		395277.5	875987.8	-0.7
B - 808		396204.9	875331.8	-1.0
B - 809		397028.0	875151.3	-1.3
B - 810		397806.7	875012.4	-1.2
B - 811		398325.2	874953.8	-1.4
B - 812		398913.2	875043.1	-1.4
B - 813		399047.6	876097.3	-1.3
B - 814		399138.9	877404.8	9.0

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Cone Penetration Test

C - 601		397129.8	876361.3	-0.1
C - 602	*abandoned, see B - 640 (DHT)*	397115.6	876534.6	-0.5
C - 701		397100.21	875839.25	-1.4
C - 702		397149.4	876042.2	0.3

Observation Wells

OW 606 L	NE Cor Conc Pad	396980.9	876733.7	-1.5
OW 606 L	Top PVC Pipe	396979.9	876732.6	1.3
OW 606 U	NE Cor Conc Pad	396939.1	876736.0	-1.8
OW 606 U	Top PVC Pipe	396938.0	876734.8	1.4
OW 606 D	NE Cor Conc Pad	396961.8	876714.2	-1.6
OW 606 D	Top PVC Pipe	396962.8	876712.9	1.6
OW 621 L	NE Cor Conc Pad	397365.4	876971.4	0.1
OW 621 L	Top PVC Pipe	397364.5	876970.0	3.1
OW 621 U	NE Cor Conc Pad	397376.4	876931.3	0.6
OW 621 U	Top PVC Pipe	397375.8	876930.0	3.9
OW 636 L	NE Cor Conc Pad	395292.1	877258.0	-0.4
OW 636 L	Top PVC Pipe	395290.8	877257.2	3.0
OW 636 U	NE Cor Conc Pad	395286.9	877216.8	-0.6
OW 636 U	Top PVC Pipe	395285.8	877215.7	2.8
OW 706 L	NE Cor Conc Pad	396979.2	875905.6	-1.0
OW 706 L	Top PVC Pipe	396978.2	875904.6	2.2
OW 706 U	NE Cor Conc Pad	396940.8	875897.1	-1.5
OW 706 U	Top PVC Pipe	396940.1	875895.7	1.7
OW 706 D	SE Cor Conc Pad	396961.2	875865.1	-1.1
OW 706 D	Top PVC Pipe	396960.1	875864.4	2.2
OW 721 L	NE Cor Conc Pad	397322.6	876121.2	-1.2
OW 721 L	Top PVC Pipe	397321.5	876120.3	2.0

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OW 721 U	NE Cor Conc Pad	397362.0	876122.8	-1.1
OW 721 U	Top PVC Pipe	397361.2	876121.4	2.0
OW 735 L	NE Cor Conc Pad	395825.2	875670.9	-0.7
OW 735 L	Top PVC Pipe	395824.3	875669.6	2.7
OW 735 U	NE Cor Conc Pad	395824.3	875710.3	-0.5
OW 735 U	Top PVC Pipe	395823.3	875709.2	2.8
OW 802 L (B-802)	NE Cor Conc Pad	398818.3	876266.8	-1.2
OW 802 L (B-802)	Top PVC Pipe	398817.1	876265.7	2.1
OW 802 U	NE Cor Conc Pad	398821.4	876244.8	-1.2
OW 802 U	Top PVC Pipe	398820.2	876243.7	2.2
OW 805 L (B-805 L)	NE Cor Conc Pad	396884.2	877240.4	-1.5
OW 805 L (B-805 L)	Top PVC Pipe	396883.0	877239.5	2.2
OW 805 U (B-805 U)	NE Cor Conc Pad	396841.9	877242.1	-1.6
OW 805 U (B-805 U)	Top PVC Pipe	396842.8	877240.9	1.2
OW 809 L	NE Cor Conc Pad	397009.2	875153.1	-0.9
OW 809 L	Top PVC Pipe	397007.9	875152.3	2.4
OW 809 U	NE Cor Conc Pad	397047.1	875153.1	-0.7
OW 809 U	Top PVC Pipe	397045.8	875152.4	2.5
OW 812 L	NE Cor Conc Pad	398894.2	875046.2	-1.2
OW 812 L	Top PVC Pipe	398892.8	875045.5	2.1
OW 812 U	NE Cor Conc Pad	398935.4	875044.2	-0.8
OW 812 U	Top PVC Pipe	398933.9	875043.5	2.2

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Test Pits			
TP 601	397105.6	876035.8	-1.4
TP 701	396988.2	875508.5	-1.4

Stilling Wells			
SW - 1	396386.8	874995.1	-2.7
SW - 2	395222.7	877124.0	-2.2