Y-12

OAK RIDGE Y-12 PLANT

LOCKHEED MARTIN

DEVELOPMENT OF A BUILDING SUMP DATABASE FOR THE Y-12 PLANT, OAK RIDGE, TENNESSEE

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Prepared for the
Water Compliance Department
Environmental Compliance Organization
Oak Ridge Y-12 Plant
Oak Ridge, Tennessee 38731

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LOCKHEED MARTIN ENERGY SYSTEMS, INC.
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LOCKHEED MARTIN ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

July 1997

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DEVELOPMENT OF A BUILDING SUMP DATABASE
FOR THE Y-12 PLANT, OAK RIDGE, TENNESSEE

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S. M. Field⁽²⁾

for the
Water Compliance Department
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Oak Ridge, Tennessee 37831

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ACRONYMS AND ABBREVIATIONS

UEFPC
GISST

Upper East Fork Poplar Creek
Geographic Information Systems Spatial Technologies

1.0 INTRODUCTION

Operations at the Oak Ridge Y-12 Plant have resulted in contamination of Upper East Fork Poplar Creek (UEFPC) and shallow groundwater through soil erosion, infiltration, and outfall discharges. The contamination of groundwater has been documented for nearly two decades, largely through well monitoring efforts.

A majority of the Y-12 Plant is underlain by the Conasauga Group (Fig. 1). The uppermost formation of the Conasauga Group is the Maynardville Limestone, which underlies the southern edge of the Y-12 Plant. The Maynardville Limestone is part of the Knox Aquifer. The remaining five formations of the Conasauga Group consist predominantly of shale lithologies and form an aquitard (Solomon et al., 1992). Groundwater movement and contaminant pathways in the shallow aquitard flow system at the Y-12 Plant are influenced by five factors: (1) the former UEFPC tributary system infilled during construction of the Y-12 plant; (2) utility systems operating at the plant, such as storm and sanitary sewers; (3) the operation of building sumps; (4) anthropogenic fill zones; and (5) stratigraphic and structural characteristics of the shallow bedrock system (AJA Technical Services, Inc., 1995). This study represents the first effort to formally identify and compile location data on sumps at the Y-12 Plant, several of which are known or are suspected to pump groundwater. Operation of several of these sumps have been documented to affect groundwater hydraulics and contaminant pathways.

This report presents preliminary results of an investigation attempting to identify sources of data on building sumps that have not previously been incorporated into existing Y-12 Plant groundwater databases. This investigation involved acquiring information on building sumps, such as location, building number, water source, discharge location, and availability of analytical data. This information was used to construct an ARC/INFO¹ database capable of simultaneously storing spatial data on sump locations and attribute information concerning the operation of individual building sumps. This database will be referred to hereafter as the Y-12 Plant Building Sump Database.

¹ARC/INFO is a registered trademark of Environmental Systems Research Institute, Redlands, Calif.

Figure 1. Topographic and Geologic Map of the Y-12 Plant.

2.0 METHODOLOGY

2.1 DATA SOURCES

The data used in creating the Y-12 Plant Building Sump Database were derived from four sources: (1) a survey of water drains in buildings at the Y-12 Plant by the Y-12 Plant Water Compliance Department; (2) the Data Adequacy Report for Upper East Fork Poplar Creek characterization area (CDM Federal Programs Corporation, 1995); (3) Y-12 Plant Engineering Organization building floor plan drawings associated with the building drain survey; and (4) personal communications with Lockheed Martin Energy Systems and PAI Corporation staff. These data sources are described in greater detail below.

2.1.1 Y-12 Plant Building Drain Survey

The Y-12 Plant building drain survey, prepared by staff from PAI Corporation and Weston Corporation, provided information for 85 known building sumps. The data for each sump consisted of the following: (1) building number; (2) floor number; (3) beam or column location; (4) a logical variable indicating whether the sump is known to be pumping groundwater; (5) the discharge location of the sump; (6) the number of the engineering drawing that shows the location of the sump; and (6) additional comments relevant to the location, operation, water source, or discharge of the sump.

2.1.2 UEFPC Data Adequacy Report

This report includes a section pertaining to building sump data, which includes information on analytical sampling that occurred at 21 sump locations in four buildings during two sampling events in 1993 and 1994. The report provides data on building number, floor number, sump location (from floor plans), beam or column location, and sump name. To a large extent, the information derived from this report overlaps with that provided by the building drain survey.

2.1.3 Engineering Building Drawings

The building floor plan drawings provided a schematic representation of the building footprints and the locations of the individual sumps described by the other data sources.

2.1.4 Personal Communications

These communications provided the locations of three additional sumps, along with comments concerning the locations, operations, and water sources for these sumps.

2.2 METHODS

2.2.1 Determination of Sump Locations

Building outlines in the form of top-down aerial views were obtained for all buildings at the Y-12 Plant from the GIS Spatial Technologies (GISST) Database. Using this database as a geospatial reference, building sump locations were hand placed using ARC/INFO, based upon their apparent locations as shown on the engineering building floor plans. In cases where no building floor plans were available, sumps were hand placed according to written descriptions given by the primary source (i.e., building drain survey logbooks or personal communication). For example, a sump location may have been described as at the "southwest corner, outside the building." In a very few cases involving small buildings, neither building floor plans nor written descriptions of sump

locations were available. In these instances, sump locations were hand placed in the approximate center of the building outlines.

The attempt to combine information from GISST building outlines with that from engineering floor plans in order to determine the spatial locations of sumps was difficult because of the limitations of, and differences between, these two types of representations. In the case of GISST building outlines, each outline represents a top-down aerial view that does not necessarily agree with the footprint of a particular floor as shown on an engineering drawing. Engineering floor plans are designed to give a schematic representation that may not necessarily reflect the actual spatial relationships of sumps and building walls. None of the building sump locations given in this database have been determined by surveys. Therefore, all sump locations should be considered as approximations only. Locations of building sumps identified by this study are shown on Figs. 2 through 4.

2.2.2 Database Design

Sump attribute data were added to the ARC/INFO database and stored in an INFO data file. In creating the database, variables were chosen so as to include the information obtained from the data sources described above, as well as information that was considered desirable for the final database but had not yet been obtained. The variables included in the database, sources of information, or methods of calculation for the individual variables are explained below.

BUILDING	The Y-12 Plant building number where each sump is located was given by the primary reference (building drain survey, data adequacy report, or personal communication) for that sump. In some cases, sumps are closely associated with a particular building but are actually located outside the building. For purposes of identification and mapping, these sumps were assigned the building number of the associated nearby building. For one sump, located near Lake Reality, there is no associated building, so BUILDING was assigned a missing value.
SUMP_ID	The 21 sumps described in the data adequacy report for which analytical data are available were assigned an ID number. For those 21 sumps, the value of SUMP_ID is identical to the data adequacy report number and represents the key variable for accessing the analytical data for these sumps. For most other sumps, values of SUMP_ID were assigned by concatenating the building number and the beam location (e.g., 9401-5_D-1). In cases where beam locations do not exist or are not available, values of SUMP_ID were assigned by concatenating the building number with some other brief location descriptor such as 'OUT' (sump located outside the building) or 'BAY' (sump located in a storage bay), as for sump '9624_BAY'. For a few sumps, no location descriptors were available. For these sumps, values of SUMP_ID were assigned values such as '9811-1_#1', '9811-1_#2', etc. Finally, the SUMP_ID for the sump located near Lake Reality, which is not associated with any building, was assigned simply as 'LAKE_REALITY'.
X-COORD, Y-COORD	Sump easting (X-COORD) and northing (Y-COORD) coordinates in the Y-12 Plant Grid system were calculated in ARC/INFO from locations determined by the hand placement method described previously.

EXPLANATION

★ SUMPS PUMPING GROUNDWATER	BUILDINGS
▼ SUMPS NOT PUMPING GROUNDWATER	ROADS
● SUMPS NOT KNOWN IF PUMPING GROUNDWATER	GEOLOGIC CONTACTS

Figure 2.
Y-12 Plant Building Sumps in
the Western Plant Area.

Figure 3.
Y-12 Plant Building Sumps in
the Central Plant Area.

EXPLANATION

★ SUMPS PUMPING GROUNDWATER	BUILDINGS
▼ SUMPS NOT PUMPING GROUNDWATER	ROADS
● SUMPS NOT KNOWN IF PUMPING GROUNDWATER	GEOLOGIC CONTACTS

Figure 4.
Y-12 Plant Building Sumps in
the Eastern Plant Area.

ELEV	Elevations were estimated for most sumps as follows. Using 5-ft. topographic contours and building outlines obtained from the GISST database, each building having one or more sumps was assigned a mean ground level elevation equal to the value of the nearest contour line. For sumps located on the first floors of their buildings, sump elevations were assumed to be the same as the estimated ground elevations of the buildings. For sumps located in the basements of their buildings, sump elevations were estimated by subtracting 10 feet, a reasonable arbitrary value, from the mean ground elevations of their respective buildings. For a few sumps, such as '9201-2_O-12', elevation data were available from published surveys. In each of these instances, the source of the elevation value is given in the COMMENTS field.
FLOOR	Floor levels (having values of either 'BASE' or 'FIRST') were obtained from the building drain survey for all sumps in the database that are located within buildings.
BEAM LOC	Beam locations represent building coordinates as found on engineering building drawings. Values of BEAM LOC were obtained from the building drain survey for most of the building sumps in the database. However, for the 21 sumps described in the data adequacy report, some beam locations differed slightly from locations for the same sumps provided in the building drain survey. In those cases, the values given by the data adequacy report were selected for entry in the database for the purpose of maintaining consistency with the associated CDM analytical database.
GRND H2O	GRND H2O is a logical variable having a value of 'YES' if a sump is known to pump groundwater, 'NO' if a sump is known not to pump groundwater, and 'UNK' if its status regarding groundwater pumping is not known. Values were obtained from the building drain survey or by personal communication.
SOURCE	SOURCE refers to the source of water for a sump in cases where this information is known. In cases where GRND H2O = 'YES', the value for SOURCE is "groundwater." In other cases, the source may be a production process, air conditioner or dehumidifier, steam, etc. For most sumps in the database, this information has not yet been obtained, and values for SOURCE appear as missing values.
DISCHARGE	DISCHARGE identifies the outfall, sanitary sewer, drain, tank, etc., that receives the water from the sump. Discharge information exists for most sumps in the database and was obtained from the building drain survey.
PUMPING	PUMPING is a logical variable having a value of 'YES' if a sump is known to currently be pumping on a regular basis and 'NO' if a sump is known not to be currently pumping on a regular basis. At the present time, this information has not been obtained for most of the sumps in the database.
ANA DATA	ANA DATA is a logical variable having a value of 'YES' if water from the sump has been analyzed and physical or chemical analytical data are known to exist, and a value of 'NO' if water from the sump has never been analyzed. Currently, analytical data are known to exist only for the 21 sumps described in the UEFPC data adequacy report. For all other sumps, the values for ANA DATA are missing.

REFERENCE	REFERENCE refers to the primary source or sources of information for a particular sump. Currently, one or more of the following sources are referenced: building drain survey; UEFPC data adequacy report; personal communications with named individuals.
DRAWING#	Engineering drawing numbers showing the locations of building sumps within particular buildings and floors have been included in the database whenever the information was available. This information was obtained from the building drain survey, the UEFPC data adequacy report, or directly from floor plan drawings included in the building drain survey.
CONTACT	The variable CONTACT is intended to cite the name of a knowledgeable person (building manager, engineer, etc.) who may be contacted for further information about a particular sump. At the present time, this information has not been obtained for any of the sumps in the database; therefore, all values appear as missing.
COMMENTS	Additional comments relevant to the location, operation, water source, or discharge of sumps have been included in the database whenever they were provided by any of the primary sources of information.

3.0 DATABASE DICTIONARY

3.1. STRUCTURE OF THE DATABASE

The Y-12 Plant Building Sump Database is stored as a geospatial database in ARC/INFO, version 7.0.3. The data are also available in a spreadsheet format compatible with Excel² and similar software. The database consists of a single ARC/INFO coverage having spatial information stored in ARC and associated attribute information stored in an INFO data file. A description of this data file is given in Table 1.

3.2 GENERAL CONVENTIONS

Variable names consist of letters (A, B, C, ... , Z), underscores (_), dashes (-), and number signs (#). Variable names range from four to nine characters long. Variables are of three types: numeric, character, and logical. For ease of use, the values for logical variables have been converted to a three-character form with possible values of 'YES', 'NO', and in some cases, 'UNK'. For all numeric variables, missing values appear in the database as the number zero. For character and logical variables, missing values appear as null fields ("").

² Excel is a registered trademark of Microsoft Corporation, Redmond, WA.

Table 1. Description of the Y-12 Plant Building Sump Attribute Data File

Variable Name	Type	Width	Decimal Places	Description
BUILDING	Character	12		Current Y-12 Plant building number
SUMP_ID	Character	10		Sump identifier (UEFPC data adequacy report)
X-COORD	Numeric	12	3	East coordinate (ft), Y-12 Plant Grid system
Y-COORD	Numeric	12	3	North coordinate (ft), Y-12 Plant Grid system
ELEV	Numeric	5		Elevation of the sump (ft above mean sea level)
FLOOR	Character	10		Level of the building ('BASE' or 'FIRST') on which the sump is found
BEAM LOC	Character	10		Location of the sump as described on an engineering building drawing, referenced by beam coordinates. Values usually consist of a letter and a number linked by a dash.
GRND H2O	Logical	3		Response to the question "Is the sump pumping groundwater?" Values are 'YES', 'NO', or 'UNK'.
SOURCE	Character	20		Origin of the water being pumped by the sump
DISCHARGE	Character	20		Disposal location (outfall, drain, tank, etc.) of the water collected by the sump
PUMPING	Logical	3		Response to the question "Is the sump pumping on a regular basis at this time?" Values are 'YES', 'NO', or missing.
ANA DATA	Logical	3		Response to the question "Are analytical data available for water from this sump?" Values are 'YES', 'NO', or missing.
REFERENCE	Character	80		Identity of the primary source or sources of information about the sump

Table 1 (continued).

Variable Name	Type	Width	Decimal Places	Description
DRAWING#	Character	20		Identification number (alphanumeric) of the engineering building drawing that shows the location of the sump
CONTACT	Character	20		Name of a person who may be contacted for further information about the sump
COMMENTS	Character	200		Additional information relevant to the location, operation, water source, or discharge of the sump

4.0 FUTURE INVESTIGATIONS

The inventory of building sumps included at present in this database represents the integration of known reference sources relating to sump locations at the Y-12 Plant. A number of buildings may be expected to contain sumps due to their locations in relation to local groundwater tables but do not as yet appear in the database. Additional information sources may also contain information about building sumps. Therefore, the identification of additional building sumps remains a priority. Characterization of water quality emanating from building sumps will be conducted as a joint effort with the UEFPC remedial investigation managed by the Environmental Restoration Program.

Future efforts related to building sumps will focus on whether any of the water pumped by particular sumps originates as groundwater. In addition, individuals who may have additional information about sumps whose water sources are currently not known will be contacted. An attempt to empirically assess whether particular sumps are likely to be pumping groundwater will be done by comparing sump elevation estimates with available data on local water table levels using geospatial software.

Future work will also ascertain whether additional analytical data are available for building sump water. As part of this investigation, it will be necessary to determine whether existing sump analytical data are adequate for the needs of current groundwater investigations or if further sampling and analyses will be necessary.

5.0 REFERENCES

AJA Technical Services, Inc., 1996, Calendar Year 1995 Groundwater Quality Report for the Upper East Fork Poplar Creek Hydrogeologic Regime, Y-12 Plant, Oak Ridge, Tennessee, Y/SUB/96-KDS15V/4.

CDM Federal Programs Corporation, 1995, Data Adequacy Report for Upper East Fork Poplar Creek Operable Unit at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee, Y/ER-208/R1.

Solomon, D.K., G.K. Moore, L.E. Toran, R.B. Dreier, W.M. McMaster, 1992, Status Report - A Hydrologic Framework for the Oak Ridge Reservation, ORNL/TM-12053.

APPENDIX

Y-12 PLANT BUILDING SUMP ATTRIBUTE DATA

BUILDING	SUMP ID	X-COORD	Y-COORD	ELEV	FLOOR	BEAM LOC	GRND H2O	SOURCE	DISCHARG	ANA DATA	DRAWING#
9201-4	SU G	56202.93	30065.96	955.00	BASE	D-28	UNK		OUT.#200	YES	P2E119268 Rev. B
9201-4	SU E	56336.79	30051.87	955.00	BASE	C-20	UNK		OUT.#200	YES	P2E119268 Rev. B
9201-4	SU F	56354.80	30249.86	955.00	BASE	K-20	UNK		OUT.#200	YES	P2E119268 Rev. B
9201-4	SU H	56224.44	30260.48	955.00	BASE	K-28	UNK		OUT.#200	YES	P2E119268 Rev. B
9201-4	SU B	56685.96	30215.67	955.00	BASE	K-2	UNK		OUT.#200	YES	P2E119268 Rev. B
9201-4	SU A	56667.25	30019.77	955.00	BASE	D-2	UNK		OUT.#200	YES	P2E119268 Rev. B
9201-4	SU C	56499.90	30043.48	955.00	BASE	D-10	UNK		OUT.#200	YES	P2E119268 Rev. B
9201-4	SU D	56510.95	30239.35	955.00	BASE	K-10	UNK		OUT.#200	YES	P2E119268 Rev. B
9201-5	SU H	55361.67	30314.39	965.00	BASE	K-28	UNK		OUT.#200	YES	P2E119271 Rev. B
9201-5	SU D	55725.54	30305.36	965.00	BASE	K-10	UNK		OUT.#200	YES	P2E119271 Rev. B
9201-5	SU C	55702.04	30120.92	965.00	BASE	D-10	UNK		OUT.#200	YES	P2E119271 Rev. B
9201-5	SU B	55809.71	30284.68	965.00	BASE	K-3	UNK		OUT.#200	YES	P2E119271 Rev. B
9201-5	SU F	55579.90	30333.06	965.00	BASE	L-21	UNK		OUT.#200	YES	P2E119271 Rev. B
9201-5	SU E	55559.67	30138.13	965.00	BASE	D-21	UNK		OUT.#200	YES	P2E119271 Rev. B
9201-5	SU G	55330.76	30163.88	965.00	BASE	D-28	UNK		OUT.#200	YES	P2E119271 Rev. B
9201-5	SU A	55791.04	30103.50	965.00	BASE	D-3	UNK		OUT.#200	YES	P2E119271 Rev. B
9204-4	SUEL	54805.18	30227.68	975.00	BASE	L-40	UNK		OUT.#200	YES	P2E119293 Rev. B
9710-3		59397.59	29741.41	0.00			UNK	spring			
9110		56785.63	30424.02	0.00			UNK				
9207		60629.14	30337.18	0.00	FIRST	F-1	NO		SANITARY		
9210		60409.50	30437.43	0.00	BASE	F-2	UNK		OUT.#21		P2E136224
9212		57652.79	31016.37	0.00	FIRST	T-10	NO		SANITARY		P2E921200A166
9212		57524.81	30694.95	0.00	FIRST	X-5	NO		SANITARY		P2E921200A187
9212		57483.20	31090.09	0.00	FIRST	W-2	UNK		OUT.#200		P2E921200A197
9212		57477.79	30820.33	0.00	BASE	E-3	UNK		SANITARY		P2E921200A186
9215		56914.64	30505.63	0.00	BASE	S-79	UNK				
9623		56679.43	29839.62	0.00	BASE		NO		SEE NOTE		
9712		62451.24	30119.85	0.00	FIRST	A-2.5	UNK		TANK		P2E134436
9731		58206.65	29755.40	0.00	BASE	B-4	NO		SANITARY		P2E973100A008
9731		58249.70	29830.92	0.00	BASE	G-6	NO		SANITARY		P2E973100A008
9731		58223.99	29876.33	0.00	BASE	K-4	NO		SANITARY		P2E973100A008
9201-1		59218.83	29231.97	0.00	BASE	B-13	YES	groundwater	OUT.#83		P2E119261
9201-1		59231.86	29413.76	0.00	BASE	M-13	YES	groundwater	OUT.#83		P2E119261
9201-1		59419.88	29358.35	0.00	BASE	K-22	YES	groundwater	OUT.#71		P2E119261
9201-1		59113.22	29471.10	0.00	FIRST	P-7	UNK		SANITARY		P2E920101A049
9201-1		59326.12	29256.64	0.00	BASE	D-18	UNK		SANITARY		P2E920101A049
9201-2		59844.01	29422.71	0.00	BASE	P-6	UNK		OUT.#55		P2E119264
9201-3		60526.49	29104.71	0.00	BASE	C-4	YES	groundwater	OUT.#34		P2E119266
9201-3		60687.66	29243.28	0.00	BASE	N-11	UNK		SANITARY		P2E920103A004

BUILDING	SUMP ID	X-COORD	Y-COORD	ELEV	FLOOR	BEAM LOC	GRND H2O	SOURCE	DISCHARG	ANA DATA	DRAWING#
9201-5 NORTH		55109.13	30534.76	0.00	FIRST	J-4	YES	groundwater	OUT #200		P2E119276
9201-3 NORTH		55296.15	30654.43	0.00	FIRST	B-12	UNK		OUT #200		P2E119276
9201-5W		55135.92	30179.11	0.00	FIRST	C-37	YES	groundwater	OUT #200		P2E134039
9204-1		57933.57	29421.50	0.00	BASE	F-15	UNK		OUT #125		P2E119282
9204-1		58021.20	29400.78	0.00	BASE	E-24	YES	groundwater	OUT #125		P2E119282
9204-1		57860.81	29504.63	0.00	BASE	J-3	UNK		OUT #125		P2E119282
9204-2E		57154.83	30391.70	0.00	FIRST	J-1	UNK		OUT #200		P2E119287
9204-3		57401.98	29640.92	0.00	BASE	N-20	NO		SANITARY		P2E920403A013
9204-3		57397.28	29586.23	0.00	BASE	J5-20	UNK		TANK		P2E119290
9204-3		57372.36	29432.42	0.00	BASE	A-21	UNK		TANK		P2E119290
9204-3		57397.53	29635.07	0.00	BASE	N-19	YES	groundwater	SANITARY		P2E920403A013
9401-2		56708.52	29661.01	0.00	FIRST	B-1	UNK		OUT #200		P2E134601
9401-2		56706.92	29645.13	0.00	FIRST	T3-1	UNK		OUT #200		P2E134601
9401-3		56100.53	29765.88	0.00	FIRST	B-5	UNK		OUT #200		P2E119303
9401-3		56183.62	29762.25	0.00	FIRST	B-10	UNK		OUT #200		P2E119303
9401-3		56134.07	29657.13	0.00	FIRST	H-5	UNK		OUT #200		P2E119303
9404-10		57294.50	29847.06	0.00	FIRST	NONE	UNK		OUT #135		P2E940410A003
9404-18		56047.98	29940.04	0.00	FIRST	A-1	UNK		TANK		P2E119306
9404-18		56135.60	29942.34	0.00	FIRST	C-5	UNK		TANK		P2E119306
9404-2		59342.84	29080.20	0.00	FIRST	B-5	UNK		OUT #77		P2E119304
9404-9		57112.73	29866.16	0.00	FIRST	NONE	UNK		OUT #200		P2E940409A001
9706-2		59040.19	29966.75	0.00	BASE		NO		SANITARY		P2E970602A006
9720-13		54360.66	29817.23	0.00	FIRST	B-2	UNK		TANK		P2E119309
9720-6		63059.00	28935.54	0.00	FIRST	BB-29	UNK		OUT #8		P2E134955
9201-2	O-12	59921.59	29411.74	920.00	BASE	O-12	YES	groundwater	Outfall 55A	YES	P2E119264 Rev. C
9201-2	F-3	59771.12	29244.21	920.00	BASE	F-3	YES	groundwater	OUT #64	YES	P2E119264 Rev. C
9201-2	E-13	59941.08	29200.48	920.00	BASE	E-13	YES	groundwater	OUT #55	YES	P2E119264 Rev. C
9201-2	E-22	60133.65	29236.37	920.00	BASE	E-22	NO		Outfall 55	YES	P2E119264 Rev. C
9202		60026.80	29971.16	0.00	FIRST	ZB-3.75	UNK		SANITARY		
9204-4		54791.46	30340.11	0.00	BASE	J-30	UNK		SANITARY		P2E920404A065
9204-2E		56910.36	30265.05	0.00	FIRST	A-7	YES	groundwater	OUT #200		P2E119287
9815		57335.43	30993.58	0.00	FIRST	F-4	UNK		OUT #200		P2E981500A001
9818		57336.63	31013.18	0.00	BASE	Z-7	UNK		OUT #200		P2E119315
9401-5		53794.03	29872.38	0.00	FIRST	D-1	UNK		TANK		P2E940105A003
9616-8		51319.92	30223.09	0.00	FIRST	B-2	NO		SEE NOTE		
9818		57316.47	31003.24	0.00	FIRST	X-6	UNK		OUT #200		P2E134034
9720-58		50819.94	29394.04	0.00	FIRST	NONE	NO		SEE NOTE		
9811-6		56053.31	29336.32	0.00	FIRST		NO		TANK		
9811-8		50668.96	29449.45	0.00	FIRST	NONE	NO		TANK		

BUILDING	SUMP ID	X-COORD	Y-COORD	ELEV	FLOOR	BEAM LOC	GRND H2O	SOURCE	DISCHARG	ANA DATA	DRAWING#
9811-1		54495.70	30095.56	0.00	FIRST	NONE	UNK		OUT.#200		P2E981101A008
9811-1		54496.60	30103.29	0.00	FIRST	NONE	UNK		SEE NOTE		P2E981101A008
9811-5		54512.43	30097.24	0.00	FIRST		UNK		OUT.#200		
9624		51274.46	29322.58	0.00	FIRST	BAY	NO		SEE NOTE		
9811-7		56207.00	29344.48	0.00	FIRST	NONE	NO		TANK		P2E981107A007
9720-45		48938.06	30318.36	0.00	FIRST	NONE	NO		SEE NOTE		
9720-60		42931.26	29830.86	0.00	FIRST	NONE	NO		SEE NOTE		
9720-60		43091.38	29829.97	0.00	FIRST	NONE	NO		SEE NOTE		
9720-5		55002.40	29634.71	0.00			YES	groundwater			
(no bldg. no.)		64168.50	29501.73	0.00			YES	groundwater			

BUILDING	REFERENCE	COMMENTS
9201-4	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room G
9201-4	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room E
9201-4	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room F
9201-4	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room H
9201-4	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room B
9201-4	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room A
9201-4	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room C
9201-4	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room D
9201-5	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room H
9201-5	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room D
9201-5	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room C
9201-5	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room B
9201-5	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room F
9201-5	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room E
9201-5	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room G
9201-5	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	Fan Room A
9204-4	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	South Elevator Pit
9710-3	Kevin Jago (personal communication)	Guard house. Spring captured in a drain. Diverted?
9110	Kevin Jago (personal communication)	West side. Outdoor sump. 36 grate. Two pumps - routed to storm drain. Deep.
9207	PAI Inventory	NEW SANITARY SUMP PUMP
9210	PAI Inventory	
9212	PAI Inventory	SUMP PUMP
9212	PAI Inventory	SUMP PUMP
9212	PAI Inventory	SUMP PUMP
9212	PAI Inventory	SUMP PUMP
9215	PAI Inventory	SUMP PUMP IN SUB-BASEMENT.WE THINK IT IS OUT OF SERVICE
9623	PAI Inventory	SUMP PIT
9712	PAI Inventory	SUMP PUMP TO TANK
9731	PAI Inventory	SUMP PUMP HAS BEEN SEALED ACCORDING TO BOOK#34
9731	PAI Inventory	SUMP PUMP HAS BEEN SEALED ACCORDING TO BOOK#34
9731	PAI Inventory	SUMP PUMP HAS BEEN SEALED ACCORDING TO BOOK#34
9201-1	PAI Inventory	SUMP PUMP
9201-1	PAI Inventory	SUMP PUMP
9201-1	PAI Inventory	SUMP PUMP
9201-1	PAI Inventory	SUMP PUMP
9201-1	PAI Inventory	SUMP TANK
9201-2	PAI Inventory	SUMP NOT IN USE (IT PUMPS TO SUMP AT COL.0-12)
9201-3	PAI Inventory	SUMP PUMP. BASEMENT DRAINS TO PUMP.
9201-3	PAI Inventory	SUMP PUMP

BUILDING	REFERENCE	COMMENTS
01-5 NOR	PAI Inventory	SUMP PUMP. UTILITIES SAID THIS WAS SPRING FED
01-5 NOR	PAI Inventory	SUMP PUMP
9201-5W	PAI Inventory	SUMP PUMP. NO DRAINS TIED TO IT.
9204-1	PAI Inventory	SUMP PUMP
9204-1	PAI Inventory	SUMP PUMP
9204-1	PAI Inventory	SUMP PUMP
9204-2E	PAI Inventory	SUMP PIT
9204-3	PAI Inventory	SUMP PUMP
9204-3	PAI Inventory	SUMP PUMP. THIS PUMP CATCHES WATER THAT LEAKS INTO BLDG. VIA RAIN
9204-3	PAI Inventory	PUMP GOES TO OIL/WATER SEPERATOR AT COL.G-18
9204-3	PAI Inventory	SUMP SHOWN ON SANITARY. IT WAS REROUTED TO STORM DRAIN.
9401-2	PAI Inventory	SUMP PUMP
9401-2	PAI Inventory	SUMP PUMP
9401-3	PAI Inventory	SUMP PUMP
9401-3	PAI Inventory	SUMP PUMP
9401-3	PAI Inventory	SUMP PUMP IS LOCATED SOUTH OF BUILDING
9404-10	PAI Inventory	SUMP PIT. NOT KNOWN IF IT HAS A PUMP
9404-18	PAI Inventory	SUMP PUMP. THIS PIT GOES TO STEAM PLANT WASTE TREATMENT FACILITY
9404-18	PAI Inventory	SUMP PUMP. THIS PIT GOES TO STEAM PLANT WASTE TREATMENT FACILITY
9404-2	PAI Inventory	SUMP PUMP IS SHOWN IN BOOK #25 DRAWINGS
9404-9	PAI Inventory	SUMP PUMP LOCATED IN PIT ON EAST SIDE OF BUILDING
9706-2	PAI Inventory	SUMP PUMP. LOCATED IN MECH. RM #02 IN THE BASEMENT
9720-13	PAI Inventory	SUMP PUMP
9720-6	PAI Inventory	SUMP PUMP THAT PULLS WATER SAMPLE OFF CREEK
9201-2	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	SUMP PUMP
9201-2	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	SUMP PUMP
9201-2	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	SUMP PUMP
9201-2	UEFPC DATA ADEQUACY REPORT (CDM); PAI Invento	WE BELIEVE THIS PUMP HAS BEEN REMOVED
9202	PAI Inventory	LIFT STATION
9204-4	PAI Inventory	SUMP PUMP
9204-2E	PAI Inventory	DATABASE IN BOOK#12 LISTS A SPRING IN THIS SUMP PUMP
9815	PAI Inventory	SUMP PUMP
9818	PAI Inventory	SUMP IS PUMPED TO A SECOND SUMP LOCATED ON THE SOUTH SIDE
9401-3	PAI Inventory	SUMP
9616-8	PAI Inventory	SUMP IS FROM COLLECTION DRAINS (FACILITY IS CLOSED). NO PUMP.
9818	PAI Inventory	SUMP IS ON THE SOUTH SIDE OF THE BUILDING
9720-58	PAI Inventory	SUMPS ARE TIED TO COLLECTION TRENCH AND HAVE NO PUMPS
9811-6	PAI Inventory	SUMP PIT IS PUMPED TO TANK ON THE SOUTH SIDE OF BUILDING
9811-8	PAI Inventory	PUMPED TO TANK AND TO WETF

BUILDING	REFERENCE	COMMENTS
9811-1	PAI Inventory	SUMP
9811-1	PAI Inventory	SUMP DRAINS TO GRADE (?)
9811-5	PAI Inventory	PER BLDG. MANAGER: DRAINS TO SUMP OR STORM DRAIN
9624	PAI Inventory	FROM TRENCHES TO SUMP, PUMPED TO TANKER AND THEN TREATED
9811-7	PAI Inventory	PUMP TO TANK AND IS RECIRCULATED FOR COOLING WATER
9720-45	PAI Inventory	SUMPS ARE PUMPED TO TANKER AND TRANSPORTED TO WETF
9720-60	PAI Inventory	SUMPS ARE PUMPED TO HOLDING TANKS AND TREATED AT WETF
9720-60	PAI Inventory	SUMPS ARE PUMPED TO HOLDING TANKS AND TREATED AT WETF
9720-5	David Watson (PAI Corp.) - personal communication	SOUTHWEST CORNER, OUTSIDE BLDG. AT MANHOLE ENTRANCE -- SPRING CAPTURED
no bldg. no.	Kevin Jago (personal communication)	LAKE REALITY SUMP -- NO BLDG. NO.

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