APPENDIX B
VERTICAL AND HORIZONTAL EXTENT OF REFUSE, BROADWAY NORTH LANDFILL
REMEDIAL INVESTIGATION REPORT
GROUNDWATER OPERABLE UNIT

Arizona Department of Environmental Quality

Broadway-Pantano Water Quality Assurance Revolving Fund Site

June 1, 2012

BROADWAY NORTH LANDFILL—
VERTICAL AND HORIZONTAL EXTENT OF REFUSE

The term refuse is used to describe typical municipal solid waste (paper, metal containers, clothing, food scraps, cleaning products, etc.) and construction debris (concrete, metal scraps, lumber, etc. To determine the approximate thickness of the refuse and cover material of the Broadway North Landfill (BNL), SECOR International, Inc. (SECOR) relied on: (1) data collected during geotechnical soil investigations conducted by Marco in 1977 (Collins, 1979; Wehran, 1979; Nicoll, 1980; and GRC,1983); and (2) lithologic logs and well construction logs/diagrams prepared by CDM (1998) and HGC (2000). The cover thickness, refuse thickness, and total depth of the boring and/or test pit at each investigative site are detailed in Table B-1 and shown on Figures B-1 and B-2. The approximate locations of the Marco, Wehran, Nicoll, and GRC investigations are shown on Figures B-3, B-4, B-5, and B-6, respectively. The approximate location of the CDM and HGC soil borings and wells are shown on Figure B-7.

In addition to using the 1953 to 1976 historical aerial photographs to delineate the approximate lateral extent of the refuse, SECOR used descriptive data from borings and test pits advanced during investigations conducted by McLaren/Hart (1998) and Aplomado (2000; 2001). Maps and narrative descriptions contained in those investigative reports were used to partially delineate the lateral extent of municipal and construction debris waste in the southernmost portion of the BNL (Figure B-8).

GEOTECHNICAL/SOIL DATA

Fourteen soil investigations (initially for geotechnical investigations and later for remedial investigations) have been completed by 11 different consultants since 1977. The following investigations have pertinence related to refuse and cover thickness data within the landfilled areas. The bulleted list below indicates: (1) the consultant which performed the work, (2) the client for whom the work was performed, in parentheses, and (3) the year the in which work was performed:

- Marco Soil & Foundation Engineers, Inc. (Cienega Corporation), 1977
- Wehran Engineering Corporation (Cienega Corporation), 1979
- G.A. Nicoll and Associates (Cienega Corporation), 1980
- Geo/Resource Consultants (Cienega Corporation), 1982
- GRC Consultants, Inc. (Cienega Corporation), 1983
- Camp Dresser & McKee (City of Tucson), 1998
- Hydro Geo Chem, Inc. (City of Tucson), 2000
- SECOR International Inc. (Arizona Department of Environmental Quality), 2004

Marco Soil & Foundation Engineers, Inc. (Cienega Corporation), 1977

Collins (1979) reports that an investigation conducted by Marco Soil & Foundation Engineers, Inc., in 1977 included advancing 31 soil borings to depths ranging from 15 to 30 feet below ground surface (bgs) in the southern portion of the BNL. Two of the soil borings were located on the east side of the Pantano Wash. Details regarding the cover and refuse thickness and the total depth of the soil borings are included in Table B-1. The soil boring locations are shown on Figure B-3.

Wehran Engineering Corporation (Cienega Corporation), 1979

Collins (1979) reports that, in 1979, Wehran Engineering Corporation excavated nine test pits on the southern portion of the BNL (Figure B-4). The cover and refuse thickness and the total depth of the excavated test pits are detailed in Table B-1.

G.A. Nicoll and Associates (Cienega Corporation), 1980

G.A. Nicoll and Associates (Nicoll, 1980) advanced 58 soil borings on the southeastern and western portions of BNL (Figure B-5). Details regarding the thickness of the cover and refuse and the total depth of the soil borings are presented in Table B-1.

Geo/Resource Consultants (Cienega Corporation), 1982

In 1982, Geo/Resource Consultants, Inc. (GRC) installed 18 LFG probes along the western margin of the BNL and two soil borings in the portion of the landfill located north of the 5th Street Extension. SECOR has not been able to determine the location of this work from the GRC (1982) report. This investigation included the use of subsurface radar and high resolution reflection seismic surveys to delineate the lateral and vertical extent of the refuse along the western portion of the BNL. According to GRC (1982), the subsurface radar survey was unsuccessful in determining the depth of the refuse. The high resolution reflection seismic surveys indicated a shallow-to-steep dip on the west margin of the landfill; and refuse thickness ranging from 15 to 25 feet below the surface along the western boundary of the BNL (GRC, 1982).

GRC Consultants, Inc. (Cienega Corporation), 1983

In 1983, GRC Consultants, Inc. (1983) excavated 15 test pits and advanced 22 soil borings. The majority of the excavated test pits and soil borings are located on the northern portion of the BNL (Figure B-6). Test pit and soil boring total depths and the thickness of the refuse and cover encountered are shown on Table B-1.

Camp Dresser & McKee (City of Tucson), 1998

From 1996 to 1998, CDM (1998) conducted field investigations and prepared a Landfill Operable Unit Remedial Investigation (RI) Report for the City of Tucson and Pima County. This extensive investigation followed a phased approach to include sampling and laboratory analysis of: (1) soil gas from existing, temporary, and newly installed monitoring probes; (2) subsurface soil; and (3) groundwater from existing and newly installed monitor wells. In July and early August 1996, five soil borings (B-1 through B-5) were advanced to 61.5 feet bgs, and one soil boring was advanced (B-6) to 100 feet bgs, utilizing a hollow-stem auger drill rig. The soil boring (B-Series) locations were chosen using the results of a shallow soil gas survey. The borings were completed as either nested or single soil monitor probes. In October 1996, based on the landfill gas results from previous soil gas surveys, three deep (approximately 200') boreholes—DP-1, DP-2, and DP-3—were drilled and equipped with nested soil gas probes. Between December 1996 and February 1997, CDM installed three groundwater monitor wells, each with four nested soil gas monitor probes, along the western side of the BNL (originally named, MW-1 through MW-3, later changed to WR-273A through WR-275A). The locations of the "B", "DP", and "WR" borehole locations are shown on Figure B-7. Well depths and refuse thickness and cover encountered are shown in Table B-1.

Hydro Geo Chem, Inc (City of Tucson), 2000

During January and February 2000, Hydro Geo Chem, Inc. (2000) installed six soil vapor extraction (SVE) wells (R-070A through R-075A) and two air injection (AI) wells (R-068A and R-069B) at the BNL. The wells were installed as part of the Early Response Action implemented at the BNL by the City of Tucson and Pima County. The remedial well locations are shown on Figure B-7. Well depths and refuse thickness and cover encountered are shown in Table B-1.

SECOR (Arizona Department of Environmental Quality), 2004

As part of the BNL vadose zone soil gas investigation and closure monitoring of the SVE/AI system, SECOR (2005) installed four deep (approximately 305') soil gas monitoring wells in the interior of the landfill. The wells were located in between the existing SVE and AI wells (Figure B-7). Refuse thickness and cover encountered are shown in Table B-1.

HISTORICAL AERIAL PHOTOGRAPH REVIEW

In addition to the historical data, SECOR subcontracted Cooper Aerial Survey Company (Cooper) to prepare a topographic map and orthophoto of the BNL and surrounding area from aerial photographs taken on December 24, 2002. The resulting map (Figure B-8), 2002 aerial photograph, and historical aerial photographs were used to: (1) accurately locate historical investigation areas; and (2) portray the current topographic conditions on the surface of the BNL as part of this RI.

Various sources (Collins, 1979; CDM, 1998; and URS, 2002) are in general agreement regarding the history and operation of the BNL. Prior to its being used as a landfill, the BNL site was part of a larger sand and gravel mining operation that began operating in the mid-1940s. In addition, the BNL property was used as an illegal dumping ground or "wildcat dump" prior to 1959 (HGL, 2012).

Landfilling operations began in approximately 1959 (HGL, 2012). Between 1959 and 1968, Sanitary District No. 1 of Pima County leased the southern portion of the property (south of the 5th Street Extension) from Mr. Stephen Gollob for use as a landfill. As a stipulation of the 1959 lease, the southernmost 300 feet of the property could be used only to dispose of construction debris or other non-biodegradable material. There were no restrictions placed on the types of refuse that went into the BNL. Placement rates ranged from a few tons per day to more than 300 tons per day during peak operation of the BNL (HGL, 2012).

Between 1959 and 1962, the City of Tucson used the southern portion of the BNL for waste disposal. In approximately 1965, the City of Tucson began operating a landfilling operation on the north side of the 5th Street Extension. Landfilling operations by the City of Tucson in the northern portion of the BNL were halted in approximately 1971. When the Sanitary District No. 1 of Pima County was dissolved in 1968, Pima County took over operations of the southern portion of the BNL. Pima County operated the southern portion of the BNL until approximately 1971 (HGL, 2012). Both BNL landfills were capped with variable thicknesses of soil. To date, SECOR has been unable to locate any written documentation regarding landfill closure dating to the closure period. In 1974, Pima County cleaned up wildcat dumping debris and re-graded the portion of BNL south of the 5th Street Extension (HGL, 2012).

Historical aerial photographs in the vicinity of the BNL from 1953, 1960, 1962, 1964, 1967, 1969, 1971, and 1976 were obtained from Cooper and examined by SECOR personnel. The following narrative and referenced figures depict the activities observed and the changes noted from the previous aerial photograph. The aerial photographs and aerial interpretation maps (excluding the 1976 enlargement) are attached.

1953 (Figure B-9): The sand and gravel operation is active on the west side of Pantano Wash, south of the present day 5th Street Extension, and on the west side and portions of the wash on the north side of the present day 5th Street Extension. The maintenance areas, offices, batching plants, and a possible hot batch (asphalt) plant are visible to the southeast of the present day intersection of Speedway Boulevard and Kolb Road. The Gollob house and outbuildings are visible near the northeast corner of present day Broadway Boulevard and Prudence Road. Figure B-10 illustrates the site conditions observed on the 1953 aerial photographs.

1960 (Figure B-11): Figure B-12 depicts the site conditions observed on the 1960 aerial photograph. The absence of conveyors on the portion of the sand and gravel operation south of the present day 5th Street Extension suggests mining operations have ceased in this area. Active mining is visible north of the 5th Street Extension. A residential development is apparent on the east side of Kolb Road and south of the 5th Street Extension. The Gollob structures are still intact. Of note is the near vertical cut along the east side of the residential development, and approximately 1,000 feet north and parallel to Broadway Boulevard. Based on the aerial photographs, the depth of the former sand and gravel operation excavations in this area could approach 25 to 30 feet below the ground level of the residential development. There does not appear to be any landfilling operations underway at the time the aerial photographs were taken.

1962 (Figure B-13): Based on the visible haul roads and recent surface grading, the southern portion of the former sand and gravel operation is actively receiving refuse material. The area south of the 5th Street Extension and immediately west of Pantano Wash (Figure B-14) appears to be at, or very close to, the present day grade of the BNL. The sand and gravel operation is still active north of the 5th Street Extension. Streets for a residential development have been rough graded in the area of Broadway Boulevard and Avenida de la Vista. The Gollob structures are still visible.

1964 (Figure B-15): The sand and gravel operation appears to be active on the north side of the 5th Street Extension. Landfilling operations are continuing on the south side of the 5th Street Extension (Figure B-16). Based on a comparison with the 1962 aerial photograph, refuse is being placed from the east to the west. The residential development at Broadway Boulevard and Avenida de la Vista has been completed, and the Gollob structures are still intact. The Tucson Electric Power (TEP) substation is under construction.

1967 (Figure B-17): Figure B-18 depicts the site conditions observed on the 1967 aerial photographs. There are two active fill areas on the southern portion of the landfill. The landfill areas near the residential development boundaries appear to be filled to present day grade. The area to the east of the intact Gollob structures appears to be nearly filled to present day grade. The active mining area of the sand and gravel operation has been reduced considerably in aerial extent. Active landfilling operations are underway to the north of the 5th Street Extension and west of Pantano Wash. The TEP substation is complete and electrical transmission line poles are evident leading east along the 5th Street Extension and then to the north on the east side of the landfill operation north of the 5th Street Extension.

1969 (Figure B-19): The portion of the landfill south of the 5th Street Extension is nearly filled. One small area (adjacent to the 5th Street Extension) appears to be active. The area adjacent to the still intact Gollob structures is likely at present day grade (Figure B-20). Recently completed landfilling activity is evident in the area north of the 5th Street Extension, west of Pantano Wash, and east of the north trending TEP electrical transmission line. The area in the vicinity of the TEP electrical transmission line appears to be in a topographic low between two landfilled areas. The sand and gravel operation appears to be active.

1971 (Figure B-21): Based on the relatively flat surface and sparse vegetation visible in the 1971 aerial photograph (Figure B-22), the landfill appears to be filled to present day grade and inactive. The Gollob structures have been removed, and the sand and gravel operation appears to be active.

1976: With the exception of a general increase in vegetative cover, there are no substantive changes in the vicinity of the BNL between the 1971 and 1976 aerial photographs.

FINDINGS

Using the information developed from the review of the historical aerial photographs, as well as the refuse and cover thickness data derived from previous investigations at the BNL, SECOR produced a map delineating the approximate lateral extent of the municipal and construction debris refuse at the closed landfill. Figure B-23 depicts the estimated lateral extent of refuse plotted on the 2002 orthophoto base map prepared by Cooper. SECOR also prepared isopach maps of the landfill cover thickness (Figure B-1) and refuse thickness (Figure B-2) based on the historical data.

The historic investigation data and historic aerial photographs suggest the following:

- The maximum refuse thickness likely occurs in portions of the landfill located: (1) to the north of the 5th Street Extension and west of the north trending TEP electrical transmission line poles; (2) between Pantano Wash and the north-trending electrical transmission line poles; and (3) immediately east of the residences, located on the east side of Flamenco Drive (Figure B-2).

- There does not appear to be any refuse placed in the large, deep pit located near the intersection of Rosewood Street and Gateway Center Circle) or the area in the vicinity of the existing asphalt-paved area east of the TEP substation (Figures B-1 and B-2).

- Although poorly delineated, there does appear to be separation between the municipal and construction debris refuse on the southernmost portion of the landfill (Figures B-23 and B-2).

- The thickness of the cover material typically is less than 3 feet over the majority of the BNL (Figure B-1). After sustained rainfall events, saturated cover material can develop “sinkholes” that can propagate following the rainfall events. One such sinkhole developed beside the SVE/AI treatment compound during 2002.

LIST OF ATTACHMENTS

TABLES

FIGURES

REFERENCES

Aplomado Environmental, LLC, 2000. Risk Evaluation of Remedial Alternatives, Broadway Store Relocation, Broadway Boulevard and Prudence Road, Tucson, Arizona. December 11, 2000.

_____, 2001. Assessment of Pads A & B, Trenching, Sample Collection & Analysis, Broadway- Prudence Center, Tucson, Arizona. August 13, 2001.

Camp, Dresser & McKee, 1998. Remedial Investigation Report, Broadway North Landfill, Tucson, Arizona. March, 1998.

Geo/Resource Consultants, Inc., 1982. Methane Gas Control Study, Broadway Landfill, Tucson, Arizona. September, 1982.

GRC Consultants, Inc., 1983. Geotechnical Investigation, North Gateway Centre, Tucson, Arizona. September, 1983.

Hydro Geo Chem, Inc., 2000. Operation and Maintenance Manual—Soil Vapor Extraction and Air Injection System at Broadway North Landfill Site, prepared for Environmental Management, City of Tucson. June 21, 2000.

John S. Collins & Associates, Inc., 1979. Analysis of Existing Data, Former Pima County Landfill/Gollob Property. October 17, 1979.

McLaren/Hart, Inc., 1998. Final Solid Waste Closure Plan, Proposed Home Depot Development Project, Tucson, Arizona. March 11, 1998.

G. A. Nicoll and Associates, Inc., 1980. Geotechnical Investigation, Broadway Landfill Site, Tucson, Arizona. November 24, 1980.

SECOR International Incorporated, 2005. Letter Report, Soil and Gas Probe Installation Activities, Broadway North Landfill, Broadway-Pantano WQARF Site. January 26, 2005.

URS Corporation, 2002. Remedial Investigation Report – Broadway- Pantano WQARF Site Groundwater Operable Unit for mid 1980's through 2000. June 30, 2002.

Wehran Engineering Corporation, 1979. Final Report, Site Development Feasibility Study, Former Broadway Landfill. August 24, 1979.

TABLE B-1
LANDFILL COVER AND REFUSE THICKNESS, BROADWAY NORTH LANDFILL
REMEDIAL INVESTIGATION REPORT
BROADWAY-PANTANO WQARF SITE
TUCSON, ARIZONA

Boring/Trench ID	Cover Thickness (feet)	Refuse Thickness (feet)	Total Depth (feet bgs)	Reference
No. 1	2	20	25	1
No. 2	2	>23	25	1
No. 3	1	19	25	1
No. 4	1	19	25	1
No. 5	<1	20	27	1
No. 6	7	14	25	1
No. 7	2	23	30	1
No. 8	1	15	25	1
No. 9	1	20	25	1
No. 10	2	18	25	1
No. 11	2	19	25	1
No. 12	1	21	25	1
No. 13	1	14	25	1
No. 14	<1	20	25	1
No. 15	1	19	25	1
No. 16	1	19	25	1
No. 17	1	19	25	1
No. 18	1	9	25	1
No. 19	1	14	20	1
No. 20	<1	20	25	1
No. 21	<1	20	25	1
No. 22	1	14	25	1
No. 23	0	0	15	1
No. 24	0	0	20	1
No. 25	0	0	15	1
No. 26	1	4	15	1
No. 27	6	4	20	1
No. 28	0	0	20	1
No. 29	0	0	20	1
No. 30	0	0	17	1
No. 31	0	0	15	1
TP-1	4	>16	20	2
TP-2	6	>15	21	2
TP-3	5	>15	20	2
TP-4	2.5	0.5	20	2
TP-5	3.5	>12.5	16	2
TP-6	2	16	20	2
TP-7	<1	>20	20	2
TP-8	2	>18	20	2
TP-9	2	>18	20	2
B-1	0	0	12	3
B-2	0	0	17	3
B-3	0	0	18	3
B-4	2.5	6	15	3
B-5	3	2	15	3
B-6	3	7	15	3
B-7	3	8	15	3
B-8	3	7	15	3

TABLE B-1
LANDFILL COVER AND REFUSE THICKNESS, BROADWAY NORTH LANDFILL
REMEDIAL INVESTIGATION REPORT
BROADWAY-PANTANO WQARF SITE
TUCSON, ARIZONA

Boring/Trench ID	Cover Thickness (feet)	Refuse Thickness (feet)	Total Depth (feet bgs)	Reference
B-9	3.5	10.5	20	3
B-10	3	3	13	3
B-11	0	0	12	3
B-12	0	0	13	3
B-13	2	4	11	3
B-14	2	5.5	15	3
B-15	3	12	22	3
B-16	1.5	13.5	20	3
B-17	2	8	15	3
B-18	2.5	3.5	15	3
B-19	2	5	15	3
B-20	1	4	15	3
B-21	<1	5	15	3
B-22	3	3	15	3
B-23	3	6	12	3
B-24	<1	3	14	3
B-25	3	11	18	3
B-26	0	0	15	3
B-27	3	4	15	3
B-28	3	7	15	3
B-29	0.5	9.5	15	3
B-30	2	4	15	3
B-31	0	0	15	3
B-32	3	10	17	3
B-33	3	11	19	3
B-34	3	10	17	3
B-35	3	9	17	3
B-36	1.5	11.5	30	3
B-37	0	0	20	3
B-38	0	0	25	3
B-39	0	0	20	3
B-40	0	0	19.5	3
B-41	0	0	30	3
B-42	0	0	21.5	3
B-43	0	0	20	3
B-44	3	12	20	3
B-45	0	0	20	3
B-46	0	0	26.5	3
B-47	0	0	20	3
B-48	0	0	20	3
B-49	0	0	25	3
B-50	4	1.5	20	3
B-51	0	0	25	3
B-52	4	15	25	3
B-53	0	0	30	3
B-54	6	12.5	23	3
B-55	0	0	20	3
B-56	6	7.5	20	3

TABLE B-1
LANDFILL COVER AND REFUSE THICKNESS, BROADWAY NORTH LANDFILL
REMEDIAL INVESTIGATION REPORT
BROADWAY-PANTANO WQARF SITE
TUCSON, ARIZONA

Boring/Trench ID	Cover Thickness (feet)	Refuse Thickness (feet)	Total Depth (feet bgs)	Reference
B-57	4	7	25	3
B-58	0	0	20	3
IC-1	0	0	10	4
IC-2	0	0	8	4
IC-3	0	0	10	4
2-1	0	0	13	4
2-2	0	0	8	4
2-3	0	0	9	4
2-4	0	0	12	4
2-5	0	0	9	4
2-6	0	0	7	4
2-7	0	0	7	4
2-8	0	0	10	4
2-9	0	0	9	4
2-10	0	0	6	4
2-11	0	0	6	4
2-12	0	0	8	4
9-4	0	0	3	4
9-5	0	0	5	4
9-6	2	2	6	4
B-1	0	0	38	4
B-2	0	0	34	4
B-3	1	32	37	4
B-4	<1	21	45	4
B-5	3	23	35	4
B-6	0	0	28	4
B-7	0	0	31	4
B-8	0	0	31	4
B-9	0	0	31	4
B-10	2	24	51	4
B-11	2	10	41	4
B-12	1	29	33	4
B-13	2	28	33	4
B-14	4	22	30	4
B-15	3	3	20	4
B-16	2	20	30	4
B-17	3	23	30	4
B-18	4	18	30	4
B-19	0	0	20	4
B-20	3	14	25	4
B-21	3	9	15	4
B-22	2	7	10	4
B-1	0	0	61.5	5
B-2	2	13	61.5	5
B-3	5	15	61.5	5
B-4	5	15	61.5	5
B-5	0	0	61.5	5
B-6	10	10	100.9	5

TABLE B-1
LANDFILL COVER AND REFUSE THICKNESS, BROADWAY NORTH LANDFILL
REMEDIAL INVESTIGATION REPORT
BROADWAY-PANTANO WQARF SITE
TUCSON, ARIZONA

Boring/Trench ID	Cover Thickness (feet)	Refuse Thickness (feet)	Total Depth (feet bgs)	Reference
DP-1	11	12	194	5
DP-2	2	22	194	5
DP-3	11	14	194	5
DP-4	2	16	305	7
DP-5	0	0	300	7
DP-6	2	6	305	7
DP-7	1	6	305	7
WR-273A	0	0	347	5
WR-274A	2	16	350	5
WR-275A	5	14	360	5
R-68A	7	14	370	6
R-69A	4	21	379	6
R-070A	8	14	250	6
R-071A	2	2	249	6
R-072A	6	4	252	6
R-073A	7	11	244	6
R-074A	0	0	248	6
R-075A	4	20	251	6

Note:
feet bgs = feet below ground surface

References:

1 John S. Collins & Associates, Inc., 1979. Analysis of Existing Data Former Pima County Landfill/Gollob Property. October 17. (Soil Boring Logs from the 1977 investigation conducted by Marco Soil & Foundation Engineers, Inc. are attached to the referenced report.)

2 Wehran Engineering Corporation, 1979. Deep Test Pit Information January (?).

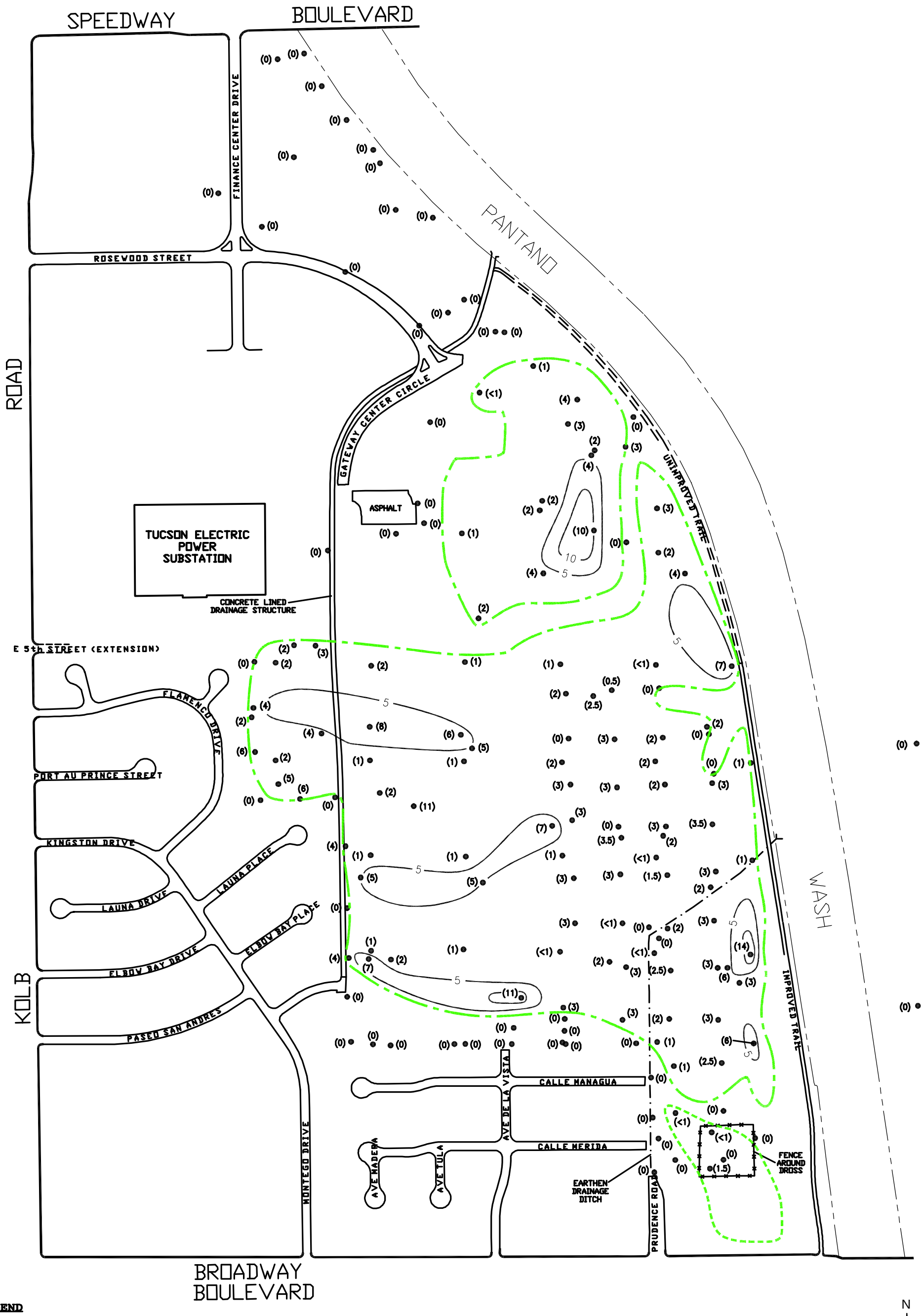
3 G.A. Nicoll and Associates, 1980. Summary Report, Geotechnical Investigation, Broadway Landfill Site, Tucson, Arizona. October 20.

4 GRC Consultants, Inc., 1983. Geotechnical Investigation, North Gateway Centre, Tucson, Arizona. September.

5 Camp Dresser & McKee, 1998. Remedial Investigation Report, Broadway North Landfill, Tucson, Arizona. March.

6 Hydro Geo Chem, Inc., 2000. Lithologic Log and Well Construction Details of R-68A (SVI-1); R-69A (SVI-2); R-070A (SVE-1); R-071A (SVE-4); R-072A (SVE-3); R-073A (SVE-2); R-074A (SVE-6); and R-075A (SVE-5). January and February.

7 SECOR International Incorporated, 2005. Soil and Gas Probe Installation Activities, Broadway North Landfill. January 27.



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FOR: BROADWAY-PANTANO WQARF SITE
TUCSON, ARIZONA

HISTORICAL COVER THICKNESS BROADWAY NORTH LANDFILL

FIGURE: B-1

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	10/28/04

SPEEDWAY

BOULEVARD

FINANCE CENTER DRIVE

ROSEWOOD STREET

PANTANO

ROAD

KOLB

GATEWAY CENTER CIRCLE

ASPHALT

TUCSON ELECTRIC POWER SUBSTATION

CONCRETE LINED DRAINAGE STRUCTURE

UNIMPROVED TRAIL

IMPROVED TRAIL

WASH

E 5th STREET (EXTENSION)

FLAMENCO DRIVE

PORT AU PRINCE STREET

KINGSTON DRIVE

LAUNA PLACE

LAUNA DRIVE

ELBOW BAY PLACE

ELBOW BAY DRIVE

PASEO SAN ANDRES

MONTEGO DRIVE

CALLE MANAGUA

AVE DE LA VISTA

CALLE MERIDA

AVE MADERA

AVE TULA

EARTHEN DRAINAGE DITCH

PRUDENCE ROAD

FENCE AROUND DROSS

BROADWAY BOULEVARD

LEGEND

- APPROXIMATE HISTORICAL DATA POINT LOCATION
- (12) REFUSE THICKNESS (FEET)
- 10 REFUSE THICKNESS CONTOURS
- APPROXIMATE EXTENT OF MUNICIPAL WASTE
- APPROXIMATE EXTENT OF CONSTRUCTION DEBRIS

N

0 400 800

SCALE IN FEET

Stantec

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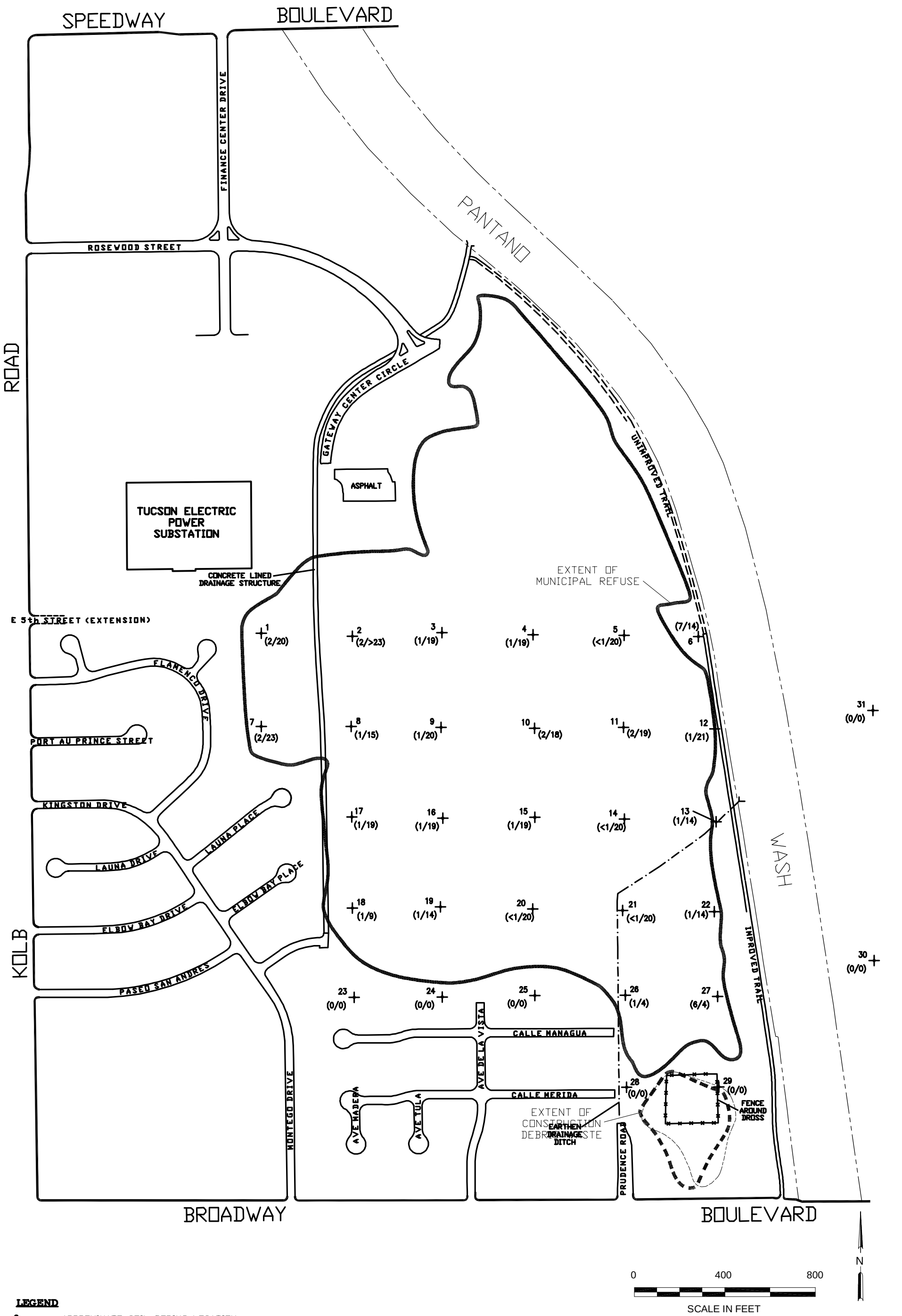
FOR: BROADWAY-PANTANO WQARF SITE

TUCSON, ARIZONA

ESTIMATED LATERAL EXTENT AND THICKNESS OF REFUSE BROADWAY NORTH LANDFILL

FIGURE: **B-2**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	10/28/04



LEGEND

8 + APPROXIMATE SOIL BORING LOCATION AND IDENTIFICATION NUMBER

(3/12) COVER THICKNESS/ REFUSE THICKNESS (FEET)

Stantec
8211 S. 48th Street
Phoenix, Arizona 85044
PHONE: (602) 438-2200 FAX: (602) 431-9562

FOR:
BROADWAY-PANTANO
WQARF SITE
LANDFILL OPERABLE UNIT
TUCSON, ARIZONA

REFUSE AND COVER THICKNESS FROM 1977 INVESTIGATION BY MARCO BROADWAY NORTH LANDFILL

FIGURE: **B-3**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006

SPEEDWAY

BOULEVARD

FINANCE CENTER DRIVE

ROSEWOOD STREET

ROAD

PANTANO

GATEWAY CENTER CIRCLE

ASPHALT

UNIMPROVED TRAIL

TUCSON ELECTRIC POWER SUBSTATION

CONCRETE LINED DRAINAGE STRUCTURE

EXTENT OF MUNICIPAL REFUSE

E 5th STREET (EXTENSION)

FLANENCO DRIVE

PORT AU PRINCE STREET

KINGSTON DRIVE

LAUNA PLACE

LAUNA DRIVE

ELBOW BAY PLACE

ELBOW BAY DRIVE

KOLB

PASEO SAN ANDRES

MONTEGO DRIVE

AVE DE LA VISTA

CALLE MANAGUA

CALLE MERIDA

AVE MADERA

AVE TULA

EXTENT OF CONSTRUCTION DEBRIS WASTE

EARTHEN DRAINAGE DITCH

PRUDENCE ROAD

FENCE AROUND DROSS

WASH

1 (4/>16)

2 (6/>15)

3 (5/>15)

4 (2.5/0.5)

5 (3.5/>12.5)

6 (2/16)

7 (<1/>20)

8 (2/>18)

9 (2/>18)

BROADWAY

BOULEVARD

N

0 400 800

SCALE IN FEET

LEGEND

8 ▪ APPROXIMATE TEST PIT LOCATION AND IDENTIFICATION NUMBER

(2/16) COVER THICKNESS/ REFUSE THICKNESS (FEET)

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Phoenix, Arizona 85044
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FOR:
BROADWAY-PANTANO
WQARF SITE
LANDFILL OPERABLE UNIT
TUCSON, ARIZONA

REFUSE AND COVER THICKNESS FROM 1979 INVESTIGATION BY WEHRAN BROADWAY NORTH LANDFILL

FIGURE: **B-4**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006

SPEEDWAY

BOULEVARD

FINANCE CENTER DRIVE

ROSEWOOD STREET

PANTANO

ROAD

GATEWAY CENTER CIRCLE

UNIMPROVED TRAIL

ASPHALT

TUCSON ELECTRIC POWER SUBSTATION

CONCRETE LINED DRAINAGE STRUCTURE

EXTENT OF MUNICIPAL REFUSE

E 5th STREET (EXTENSION)

B-58 (0/0)

FLAMENCO DRIVE

B-57 (4/7)

B-56 (6/7.5)

PORT AU PRINCE STREET

(6/12.5)

B-54

B-55 (0/0)

B-53 (0/0)

KINGSTON DRIVE

LAUNA PLACE

B-52 (4/15)

LAUNA DRIVE

ELBOW BAY PLACE

B-51 (0/0)

ELBOW BAY DRIVE

B-50 (4/1.5)

KOLB

B-49 (0/0)

PASEO SAN ANDRES

B-48 (0/0)

B-47 (0/0)

B-46 (0/0)

B-45 (0/0)

B-44 (3/12)

B-42 (0/0)

B-43 (0/0)

B-41 (0/0)

B-40 (0/0)

B-30 (2/4)

B-29 (0.5/9.5)

B-12 (0/0)

B-31 (0/0)

B-28 (3/7)

B-13 (2/4)

B-11 (0/0)

B-32 (3/10)

B-27 (3/4)

B-14 (2/5.5)

B-10 (3/3)

B-33 (3/11)

B-26 (0/0)

B-15 (3/12)

B-9 (3.5/10.5)

B-34 (3/10)

B-25 (3/11)

B-16 (1.5/13.5)

B-8 (3/7)

B-35 (3/9)

B-24 (<1/3)

B-17 (2/8)

B-7 (3/8)

B-23 (3/6)

B-18 (2.5/3.5)

B-6 (3/7)

B-22 (3/3)

B-19 (2/5)

B-5 (3/2)

B-20 (1/4)

B-4 (2.5/6)

CALLE MANAGUA

B-39 (0/0)

AVE DE LA VISTA

B-38 (0/0)

B-21 (<1/5)

B-3 (0/0)

CALLE MERIDA

B-1 (0/0)

B-2 (0/0)

FENCE AROUND DROSS

AVE MADERA

AVE TULA

EXTENT OF CONSTRUCTION DEBRIS WASTE

B-37 (0/0)

EARTHEN DRAINAGE DITCH

B-36 (1.5/11.5)

PRUDENCE ROAD

MONTEGO DRIVE

IMPROVED TRAIL

WASH

BROADWAY

BOULEVARD

N

0 400 800

SCALE IN FEET

LEGEND

B-1 + APPROXIMATE SOIL BORING LOCATION AND IDENTIFICATION NUMBER

(3/12) COVER THICKNESS/ REFUSE THICKNESS (FEET)

Stantec
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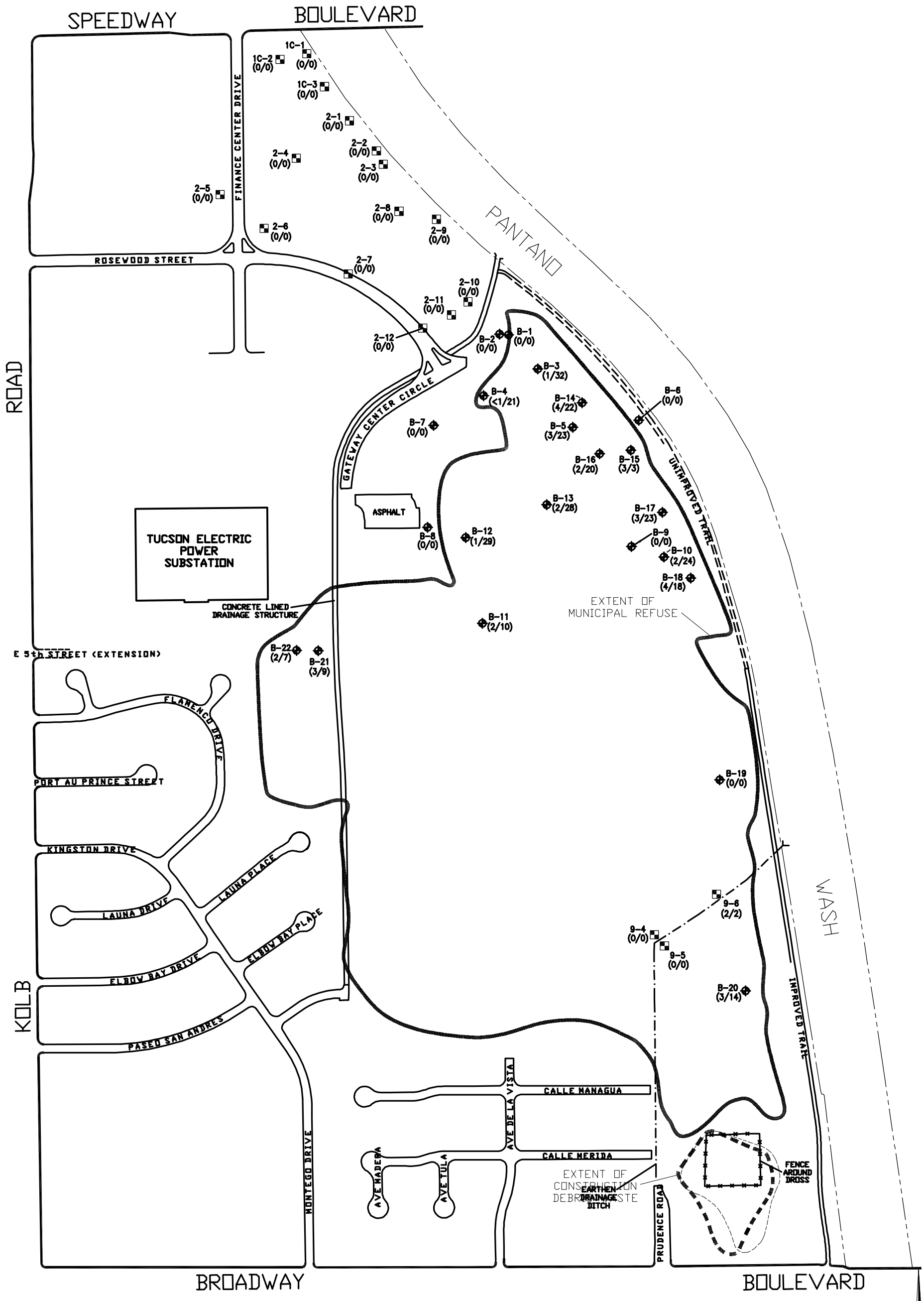
Phoenix, Arizona 85044
PHONE: (602) 438-2200 FAX: (602) 431-9562

FOR: BROADWAY-PANTANO WQARF SITE LANDFILL OPERABLE UNIT TUCSON, ARIZONA

REFUSE AND COVER THICKNESS FROM 1980 INVESTIGATION BY G.A. NICOLL BROADWAY NORTH LANDFILL

FIGURE: **B-5**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006



LEGEND

- B-1 — APPROXIMATE SOIL BORING LOCATION AND IDENTIFICATION NUMBER
- IC-3 — APPROXIMATE TEST TRENCH LOCATION AND IDENTIFICATION NUMBER
- (3/12) — COVER THICKNESS/ REFUSE THICKNESS (FEET)

Stantec
8211 S. 48th Street
Phoenix, Arizona 85044
PHONE:(602) 438-2200 FAX:(602) 431-9562

FOR: BROADWAY-PANTANO WQARF SITE LANDFILL OPERABLE UNIT TUCSON, ARIZONA

REFUSE AND COVER THICKNESS FROM 1983 INVESTIGATION BY GRC BROADWAY NORTH LANDFILL

FIGURE: **B-6**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006

SPEEDWAY

BOULEVARD

FINANCE CENTER DRIVE

ROSEWOOD STREET

ROAD

PANTANO

GATEWAY CENTER CIRCLE

UNIMPROVED TRAFFIC

DP-7 (1/6)

R075A (4/20)

ASPHALT

R074A (0/0)

DP-2 (2/22)

B-6 (10/10)

TUCSON ELECTRIC POWER SUBSTATION

WR-273A (0/0)

DP-5 (0/0)

B-5 (0/0)

R069A (4/21)

CONCRETE LINED DRAINAGE STRUCTURE

E 5th STREET (EXTENSION)

FLAMENCO DRIVE

WR-274A (2/16)

DP-6 (2/6)

R071A (2/2)

R070A (8/14)

B-4 (5/15)

PORT AU PRINCE STREET

B-3 (5/15)

DP-3 (11/14)

KINGSTON DRIVE

LAUNA PLACE

R068A (7/14)

B-2 (2/13)

WR-275A (5/14)

LAUNA DRIVE

ELBOW BAY PLACE

DP-4 (2/16)

ELBOW BAY DRIVE

R073A (7/11)

R072A (6/4)

KOLB

(11/12) DP-1

B-1 (0/0)

PASEO SAN ANDRES

IMPROVED TRAFFIC

WASH

CALLE MANAGUA

AVE DE LA VISTA

CALLE MERIDA

AVE MADERA

AVE TULA

MONTEGO DRIVE

EARTHEN DRAINAGE DITCH

PRUDENCE ROAD

FENCE AROUND DROSS

BROADWAY

LEGEND

- APPROXIMATE SOIL BORING LOCATION (CDM, JULY & AUGUST 1996)
- DEEP MONITORING PROBE (CDM, JULY 1996) DP-1 THROUGH DP-3
- DEEP MONITORING PROBE (SECOR, 2004) DP-4 THROUGH DP-7
- MONITORING PROBE (CDM, OCTOBER 1996)
- CITY OF TUCSON MONITORING WELL (CDM, DECEMBER 1996 & JANUARY 1997)
- AIR INJECTION WELL (HGC, 2000)
- VAPOR EXTRACTION WELL (HGC, 2000)
- (3/12) COVER THICKNESS/ REFUSE THICKNESS (FEET)

N

0 400 800

SCALE IN FEET

Stantec
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FOR:
BROADWAY-PANTANO
WQARF SITE
LANDFILL OPERABLE UNIT
TUCSON, ARIZONA

REFUSE AND COVER THICKNESS FROM 1996, 1997, 2000, & 2004 PROBE AND WELL INSTALLATIONS BROADWAY NORTH LANDFILL

FIGURE: **B-7**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
	KJG	TAK		DECEMBER 2006

GATEWAY CENTER CIRCLE

ASPHALT

UNIMPROVED TRAIL

ELECTRIC POWER STATION

EXTENT OF MUNICIPAL REFUSE

METHANE CONTROL SYSTEM COMPOUND

LAUNA PLACE

ELBOW BAY PLACE

ANDRES

MONTEGO DRIVE

AVE DE LA VISTA

CALLE MANAGUA

CALLE MERIDA

AVE MADERA

AVE TULA

EXTENT OF CONSTRUCTION DEBRIS WASTE

PRUDENCE ROAD

FENCE AROUND DROSS

IMPROVED TRAIL

WASH

BROADWAY

BOULEVARD

N

0 300 600

SCALE IN FEET

LEGEND

APPROXIMATE EXTENT OF MUNICIPAL WASTE

APPROXIMATE EXTENT OF CONSTRUCTION DEBRIS

APPROXIMATE EXTENT OF DROSS

LEGEND

TOPOGRAPHIC MAP PRODUCED FROM AERIAL SURVEY BY COOPER AERIAL SURVEY IN DECEMBER 2002.

CONTOUR INTERVAL = 2 FEET

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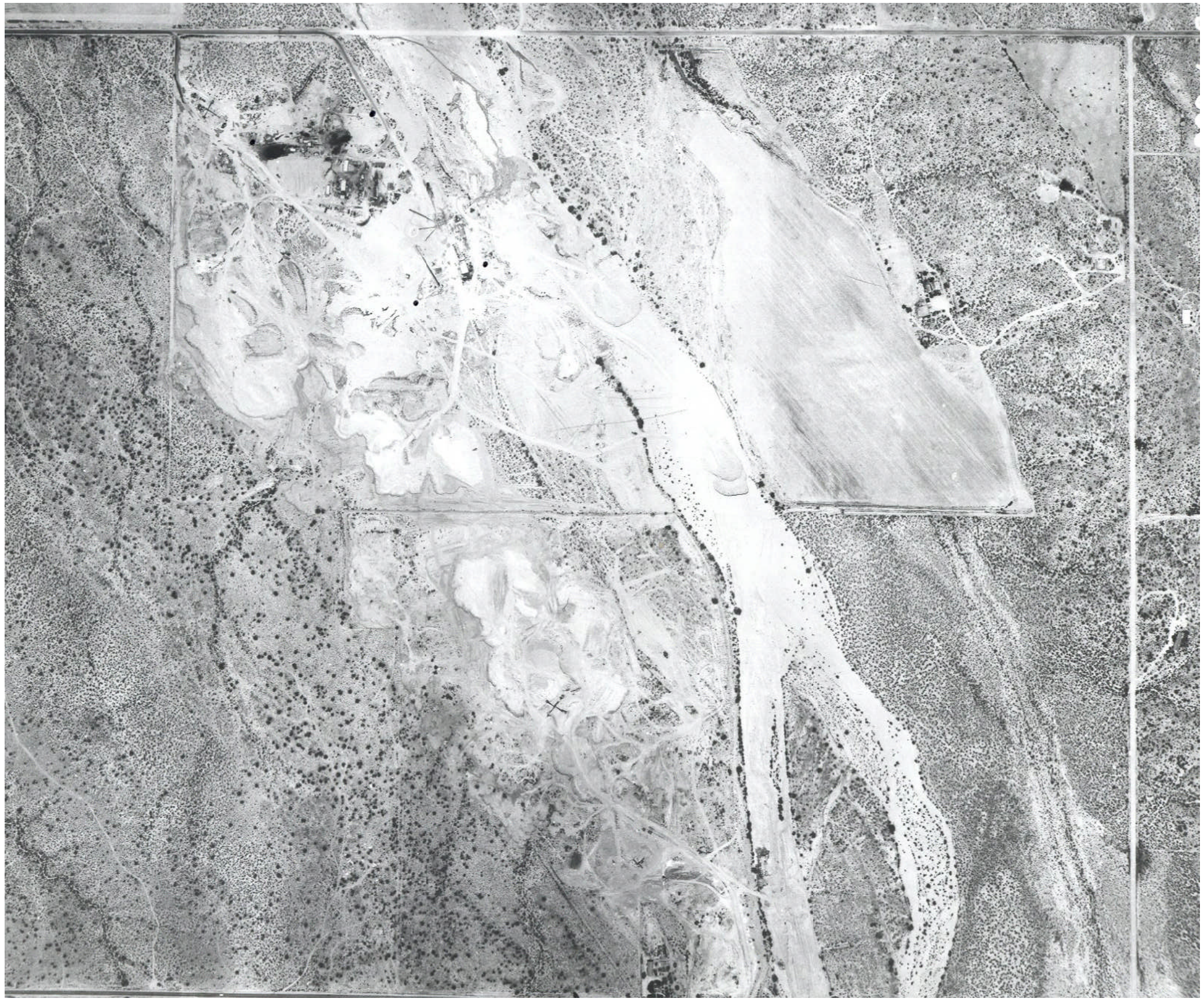
FOR:
BROADWAY-PANTANO
WQARF SITE
LANDFILL OPERABLE UNIT
TUCSON, ARIZONA

2002 TOPOGRAPHIC MAP OF MUNICIPAL AND CONSTRUCTION DEBRIS REFUSE, BROADWAY NORTH LANDFILL

FIGURE:
B-8

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006



N

0 600 1200

SCALE IN FEET

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BROADWAY-PANTANO
WQARF SITE

TUCSON, ARIZONA

1953 HISTORICAL AERIAL PHOTOGRAPH (COOPER AERIAL) BROADWAY NORTH LANDFILL

FIGURE:
B-9

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 200

SPEEDWAY BOULEVARD

SAND & GRAVEL OPERATIONS AREA (OFFICES, BATCHING PLANTS, MAINTENANCE BUILDINGS, AND STOCKPILES)

PROBABLE HOT BATCH (ASPHALT) PLANT LOCATION (APPROXIMATE)

ASPHALT

EXTENT OF ACTIVE SAND & GRAVEL MINING OPERATIONS

UNDISTURBED NATIVE DESERT VEGETATION

PANTANO WASH

GOLLOB RESIDENCE AND OUTBUILDINGS

BROADWAY BOULEVARD

N

0 400 800

SCALE IN FEET

NOTE: LOCATIONS OF STRUCTURAL, PHYSICAL, AND GEOGRAPHICAL FEATURES ARE APPROXIMATE.

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Phoenix, Arizona 85044
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FOR: BROADWAY-PANTANO WQARF SITE

TUCSON, ARIZONA

SITE CONDITIONS BASED ON INTERPRETATION OF 1953 AERIAL PHOTOGRAPH (COOPER AERIAL)

FIGURE: **B-10**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006

N

0 600 1200

SCALE IN FEET

Stantec
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Phoenix, Arizona 85044
PHONE:(602) 438-2200 FAX:(602) 431-9562

BROADWAY-PANTANO
WQARF SITE

TUCSON, ARIZONA

1960 HISTORICAL AERIAL PHOTOGRAPH (COOPER AERIAL) BROADWAY NORTH LANDFILL

FIGURE:
B-11

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 200

SPEEDWAY BOULEVARD

SAND & GRAVEL OPERATIONS AREA (OFFICES, BATCHING PLANTS, MAINTENANCE BUILDINGS, AND STOCKPILES.)

EXTENT OF ACTIVE SAND & GRAVEL MINING OPERATIONS

FLAMENCO DRIVE

PORT AU PRINCE STREET

NEWLY COMPLETED RESIDENTIAL DEVELOPMENT

KINGSTON DRIVE

KOLB ROAD

LAUNA PLACE

LAUNA DRIVE

ELBOW BAY PLACE

ELBOW BAY DRIVE

PASEO SAN ANDRES

NEAR VERTICAL CUT SLOPE ALONG FENCE LINE

EXTENT OF PREVIOUS SAND & GRAVEL MINING OPERATIONS

NEAR VERTICAL CUT SLOPE ALONG FENCE LINE

NEAR VERTICAL CUT SLOPE

TEMPORARY CONTRACTORS STORAGE AREA

UNDISTURBED NATIVE DESERT VEGETATION

MONTEGO DRIVE

UNDISTURBED NATIVE DESERT VEGETATION

GOLLOB RESIDENCE AND OUTBUILDINGS

PANTANO WASH

BROADWAY BOULEVARD

N

0 400 800

SCALE IN FEET

NOTE: LOCATIONS OF STRUCTURAL, PHYSICAL, AND GEOGRAPHICAL FEATURES ARE APPROXIMATE.

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Phoenix, Arizona 85044
PHONE:(602) 438-2200 FAX:(602) 431-9562

FOR:
BROADWAY-PANTANO
WQARF SITE
LANDFILL OPERABLE UNIT
TUCSON, ARIZONA

SITE CONDITIONS BASED ON INTERPRETATION OF 1960 AERIAL PHOTOGRAPH (COOPER AERIAL)

FIGURE: **B-12**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006

N

0 600 1200

SCALE IN FEET

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BROADWAY-PANTANO
WQARF SITE

TUCSON, ARIZONA

1962 HISTORICAL AERIAL PHOTOGRAPH (COOPER AERIAL) BROADWAY NORTH LANDFILL

FIGURE:
B-13

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 200

SPEEDWAY BOULEVARD

SAND & GRAVEL OPERATIONS AREA (OFFICES, BATCHING PLANTS, MAINTENANCE BUILDINGS, AND STOCKPILES.)

EXTENT OF ACTIVE SAND & GRAVEL MINING OPERATIONS

FLAMENCO DRIVE

RESIDENTIAL

PORT AU PRINCE STREET

KINGSTON DRIVE

LAUNA DRIVE

LAUNA PLACE

ELBOW BAY PLACE

ELBOW BAY DRIVE

PASEO SAN ANDRES

KOLB ROAD

NEAR VERTICAL CUT SLOPE ALONG FENCE LINE

AREA

NEAR VERTICAL CUT SLOPE ALONG FENCE LINE

NEAR VERTICAL CUT SLOPE

EXTENT OF LANDFILLED AREA

PANTANO WASH

LANDFILL INGRESS/ EGRESS ROAD

CALLE MANAGUA

AVE DE LA VISTA

ROUGH GRADED STREETS

CALLE MERIDA

AVE MADERA

AVE TULA

UNDEVELOPED LAND

RETAIL GASOLINE/ SERVICE STATION

MONTEGO DRIVE

NEW RESIDENTIAL DEVELOPMENT

GOLLOB RESIDENCE AND OUTBUILDINGS

UNDEVELOPED LAND

BROADWAY BOULEVARD

0 400 800

SCALE IN FEET

N

NOTE: LOCATIONS OF STRUCTURAL, PHYSICAL, AND GEOGRAPHICAL FEATURES ARE APPROXIMATE.

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Phoenix, Arizona 85044
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FOR:
BROADWAY-PANTANO
WQARF SITE
LANDFILL OPERABLE UNIT
TUCSON, ARIZONA

SITE CONDITIONS BASED ON INTERPRETATION OF 1962 AERIAL PHOTOGRAPH (COOPER AERIAL)

FIGURE:
B-14

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006

N

0 600 1200

SCALE IN FEET

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BROADWAY-PANTANO
WQARF SITE

TUCSON, ARIZONA

1964 HISTORICAL AERIAL PHOTOGRAPH (COOPER AERIAL) BROADWAY NORTH LANDFILL

FIGURE:
B-15

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 200

SPEEDWAY BOULEVARD

SAND & GRAVEL OPERATIONS AREA (OFFICES, BATCHING PLANTS, MAINTENANCE BUILDINGS, AND STOCKPILES.)

EXTENT OF ACTIVE SAND & GRAVEL MINING OPERATIONS

TUCSON ELECTRIC POWER SUBSTATION (UNDER CONSTRUCTION)

FLAMENCO DRIVE

RESIDENTIAL AREA

PORT AU PRINCE STREET

KINGSTON DRIVE

LAUNA PLACE

LAUNA DRIVE

ELBOW BAY PLACE

ELBOW BAY DRIVE

PASEO SAN ANDRES

KOLB ROAD

NEAR VERTICAL CUT SLOPE ALONG FENCE LINE

EXTENT OF LANDFILLED AREA

PANTANO WASH

LANDFILL INGRESS/ EGRESS ROAD

UNDEVELOPED LAND

RETAIL GASOLINE/ SERVICE STATION

MONTEGO DRIVE

RESIDENTIAL AREA

AVE DE LA VISTA

CALLE MANAGUA

CALLE MERIDA

AVE MADERA

AVE TULA

GOLLOB RESIDENCE AND OUTBUILDINGS

UNDEVELOPED LAND

UNDEVELOPED LAND

BROADWAY BOULEVARD

EXTENT OF LANDFILLED AREA

N

0 400 800

SCALE IN FEET

NOTE: LOCATIONS OF STRUCTURAL, PHYSICAL, AND GEOGRAPHICAL FEATURES ARE APPROXIMATE.

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Phoenix, Arizona 85044
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FOR: BROADWAY-PANTANO WQARF SITE LANDFILL OPERABLE UNIT TUCSON, ARIZONA

SITE CONDITIONS BASED ON INTERPRETATION OF 1964 AERIAL PHOTOGRAPH (COOPER AERIAL)

FIGURE: **B-16**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006

N

0 600 1200

SCALE IN FEET

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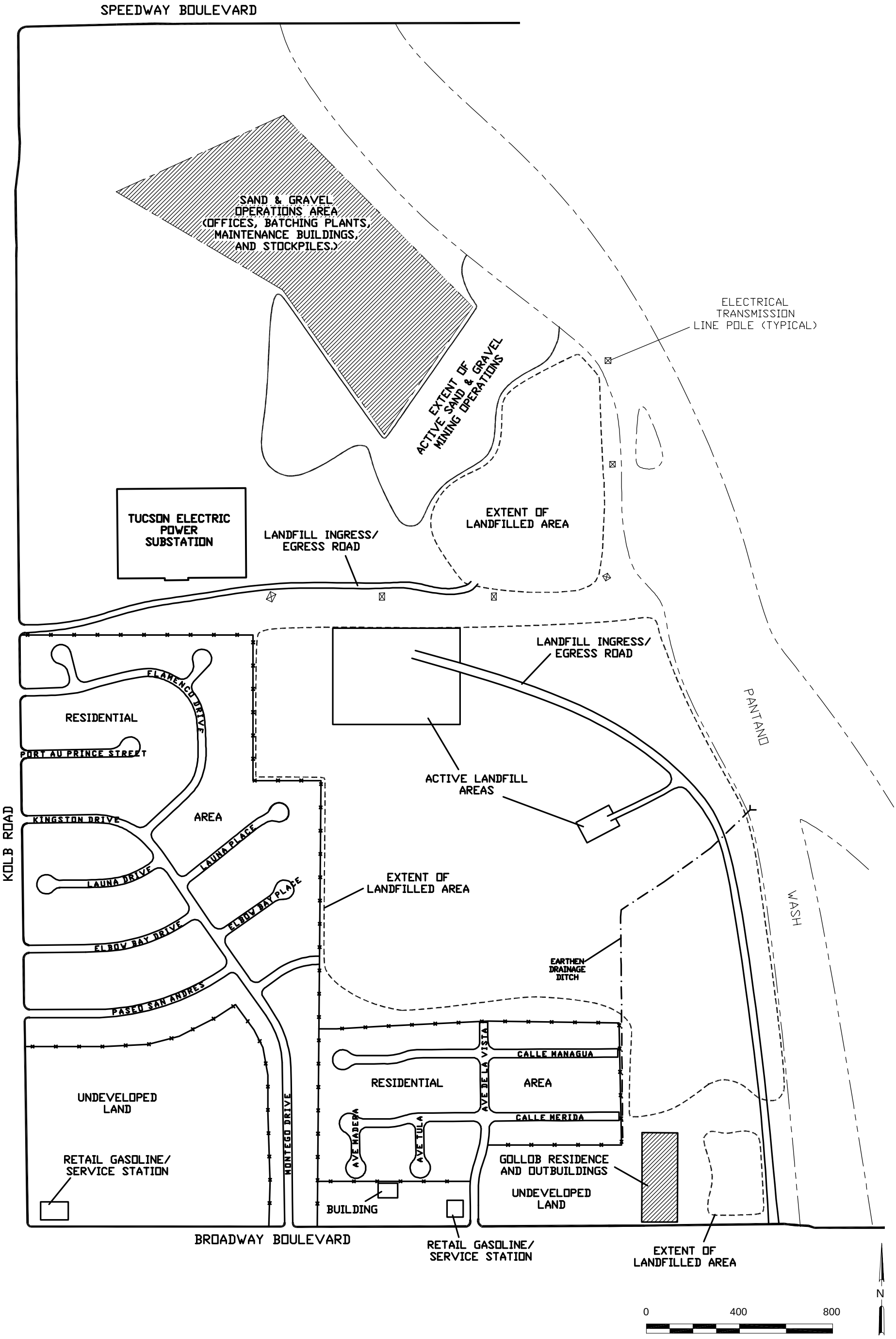
BROADWAY-PANTANO
WQARF SITE

TUCSON, ARIZONA

1967 HISTORICAL AERIAL PHOTOGRAPH (COOPER AERIAL) BROADWAY NORTH LANDFILL

FIGURE:
B-17

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18QT.20401.07	MDR	TAK	CBP	DECEMBER 200



NOTE: LOCATIONS OF STRUCTURAL, PHYSICAL, AND GEOGRAPHICAL FEATURES ARE APPROXIMATE.

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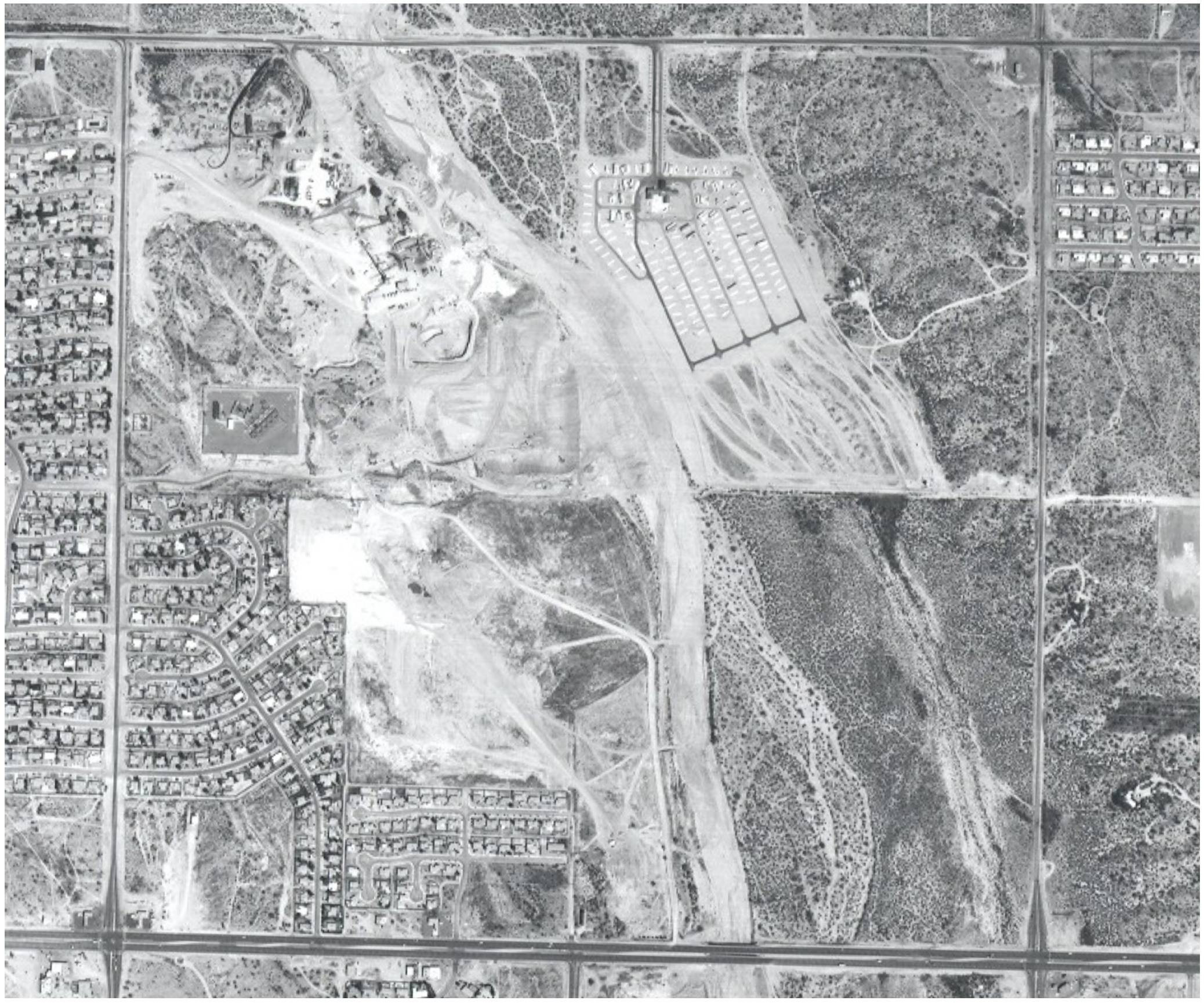
Phoenix, Arizona 85044
PHONE:(602) 438-2200 FAX:(602) 431-9562

FOR:
BROADWAY-PANTANO
WQARF SITE
LANDFILL OPERABLE UNIT
TUCSON, ARIZONA

SITE CONDITIONS BASED ON INTERPRETATION OF 1967 AERIAL PHOTOGRAPH (COOPER AERIAL)

FIGURE: **B-18**

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006



N

0 600 1200

SCALE IN FEET

Stantec
8211 S. 48th Street
Phoenix, Arizona 85044
PHONE:(602) 438-2200 FAX:(602) 431-9562

BROADWAY-PANTANO
WQARF SITE

TUCSON, ARIZONA

1969 HISTORICAL AERIAL PHOTOGRAPH (COOPER AERIAL) BROADWAY NORTH LANDFILL

FIGURE:
B-19

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 200

SPEEDWAY BOULEVARD

SAND & GRAVEL OPERATIONS AREA (OFFICES, BATCHING PLANTS, MAINTENANCE BUILDINGS, AND STOCKPILES.)

EXTENT OF ACTIVE SAND & GRAVEL MINING OPERATIONS

ELECTRICAL TRANSMISSIOIN LINE POLE (TYPICAL)

TOPOGRAPHIC LOW AREA ALONG TRANSMISSION LINE POLES.

EXTENT OF LANDFILLED AREA

EXTENT OF LANDFILLED AREA

TUCSON ELECTRIC POWER SUBSTATION

LANDFILL INGRESS/ EGRESS ROAD

LANDFILL INGRESS/ EGRESS ROAD

ACTIVE LANDFILL AREA

PANTANO WASH

KOLB ROAD

FLAMENCO DRIVE

RESIDENTIAL AREA

PORT AU PRINCE STREET

KINGSTON DRIVE

LAUNA PLACE

LAUNA DRIVE

ELBOW BAY PLACE

ELBOW BAY DRIVE

PASED SAN ANDRES

EARTHEN DRAINAGE DITCH

AVE DE LA VISTA

CALLE MANAGUA

RESIDENTIAL AREA

CALLE MERIDA

AVE MADERA

AVE TULA

MONTEGO DRIVE

UNDEVELOPED LAND

RETAIL GASOLINE/ SERVICE STATION

BUILDING

GOLLOB RESIDENCE AND OUTBUILDINGS

UNDEVELOPED LAND

BROADWAY BOULEVARD

RETAIL GASOLINE/ SERVICE STATION

NEWLY LANDFILLED AREA (APPROXIMATE)

N

0 400 800

SCALE IN FEET

NOTE: LOCATIONS OF STRUCTURAL, PHYSICAL, AND GEOGRAPHICAL FEATURES ARE APPROXIMATE.

Stantec
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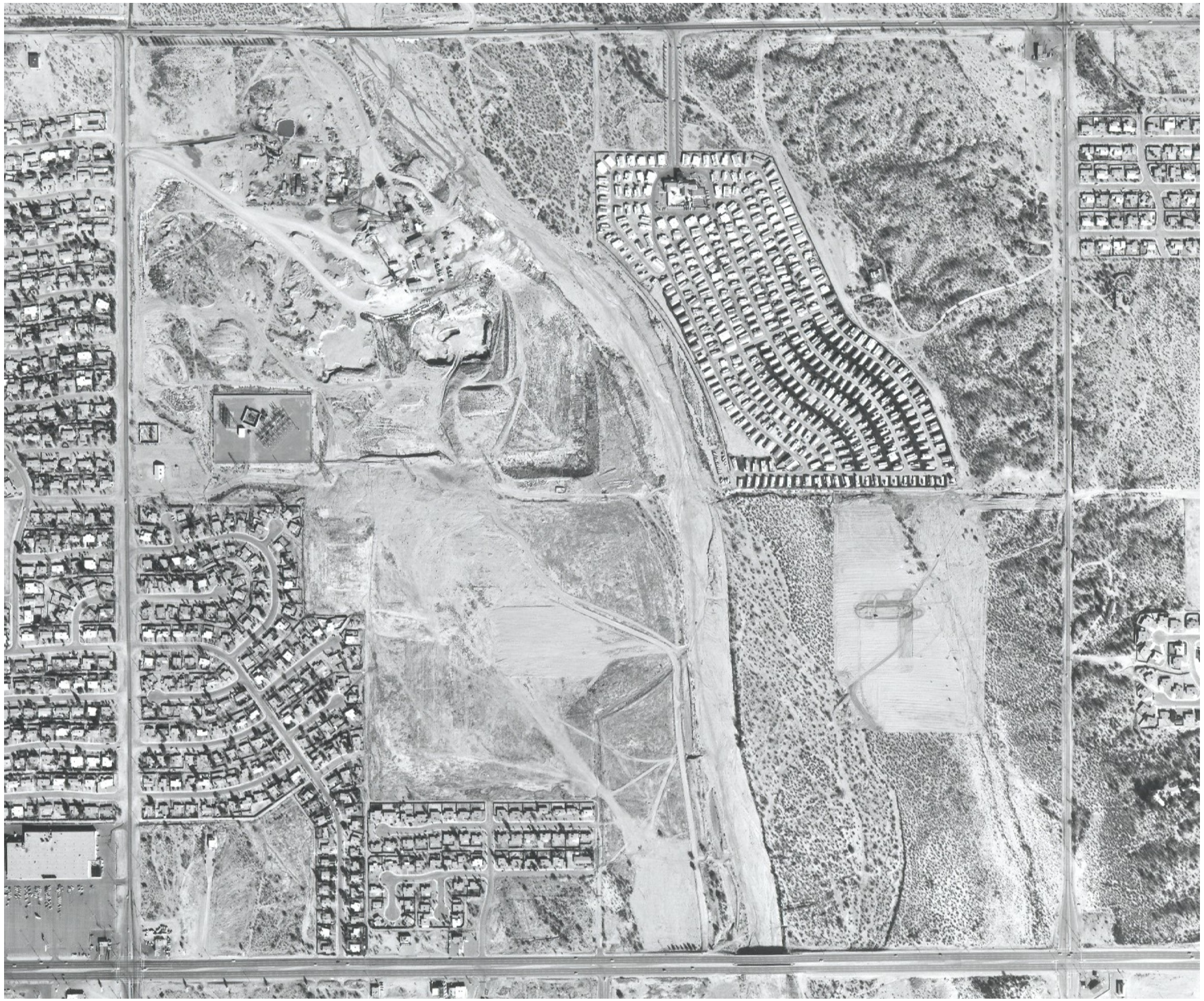
FOR:
BROADWAY-PANTANO
WQARF SITE
LANDFILL OPERABLE UNIT
TUCSON, ARIZONA

SITE CONDITIONS BASED ON INTERPRETATION OF 1969 AERIAL PHOTOGRAPH (COOPER AERIAL)

FIGURE:
B-20

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
18OT.20401.07	MDR	TAK	CRP	DECEMBER 2006



N

0 600 1200

SCALE IN FEET

Stantec
8211 S. 48th Street
Phoenix, Arizona 85044
PHONE: (602) 438-2200 FAX: (602) 431-9562

BROADWAY-PANTANO
WQARF SITE

TUCSON, ARIZONA

1971 HISTORICAL AERIAL PHOTOGRAPH (COOPER AERIAL) BROADWAY NORTH LANDFILL

FIGURE:
B-21

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SPEEDWAY BOULEVARD

SAND & GRAVEL OPERATIONS AREA (OFFICES, BATCHING PLANTS, MAINTENANCE BUILDINGS, AND STOCKPILES.)

EXTENT OF ACTIVE SAND & GRAVEL MINING OPERATIONS

ELECTRICAL TRANSMISSION LINE POLE (TYPICAL)

TUCSON ELECTRIC POWER SUBSTATION

COMMERCIAL BUILDINGS

UNDEVELOPED LAND (RELATIVELY FLAT WITH NUMEROUS VEHICLE TRAILS AND SPARSE VEGETATION NO EVIDENCE OF ACTIVE LANDFILLING OPERATIONS)

PANTANO WASH

EARTHEN DRAINAGE DITCH

KOLB ROAD

RESIDENTIAL AREA

FLAMENCO DRIVE

PORT AU PRINCE STREET

KINGSTON DRIVE

LAUNA PLACE

LAUNA DRIVE

ELBOW BAY PLACE

ELBOW BAY DRIVE

PASEO SAN ANDRES

RESIDENTIAL AREA

AVE DE LA VISTA

CALLE MANAGUA

CALLE MERIDA

AVE MADERA

AVE TULA

UNDEVELOPED LAND

MONTEGO DRIVE

PRUDENCE ROAD

RETAIL GASOLINE/ SERVICE STATION

BUILDING

UNDEVELOPED LAND

BROADWAY BOULEVARD

RETAIL GASOLINE/ SERVICE STATION

N

0 400 800

SCALE IN FEET

NOTE: LOCATIONS OF STRUCTURAL, PHYSICAL, AND GEOGRAPHICAL FEATURES ARE APPROXIMATE.

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FOR:
BROADWAY-PANTANO
WQARF SITE
LANDFILL OPERABLE UNIT
TUCSON, ARIZONA

SITE CONDITIONS BASED ON INTERPRETATION OF 1971 AERIAL PHOTOGRAPH (COOPER AERIAL)

FIGURE:
B-22

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
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Legend

Extent of Contruction Debris

Extent of Municipal Waste

0 125 250 500 750 1,000 Feet

N

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BROADWAY-PANTANO WQARF SITE

TUCSON, ARIZONA

APPROXIMATE LATERAL EXTENT OF MUNICIPAL AND CONSTRUCTION DEBRIS REFUSE BROADWAY NORTH LANDFILL

FIGURE: **B-23**

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