

APPENDIX A

LOOP CLOSURES

2005

GEODETTIC CONTROL DENSIFICATION
AND RESTORATION

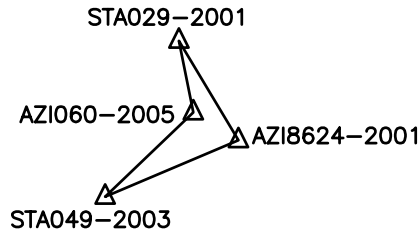
of

JEFFERSON COUNTY, KENTUCKY

JUNE 2005

Jacobi, Toombs and Lanz, Inc.
401 West Main Street, Suite 600
Louisville, Kentucky 40202





GPS Loop # 1:				
STA049-2003: AZI8624-2001: STA029-2001: AZI060-2005: STA049-2003:				
Observations:				
Baseline ID	Solution ID	From	To	Solution Type
B40	S2	STA 049-2003	AZI 8624-2001	L1 fixed
B73	S3	AZI 8624-2001	STA 029-2001	L1 fixed
B61	S26	AZI 060-2005	STA 029-2001	L1 fixed
B16	S21	STA 049-2003	AZI 060-2005	L1 fixed
Passed Combination for Loop 1:				
S2-S3-S26-S21				
		Length	Horiz	Vert
		47468.411sft	0.047sft	0.050sft
				PPM
				1.452



GPS NETWORK DENSIFICATION FOR
LOUISVILLE/JEFFERSON COUNTY INFORMATION CONSORTIUM

STATIC NETWORK LOOP #1 CLOSURE

JACOBI, TOOMBS & LANZ, INC.
CONSULTING ENGINEERS
120 BELL AVENUE
CLARKSVILLE, INDIANA 47129
(812) 288-6646



EXHIBIT

1 of 10

SCALE: 1" = 20000'

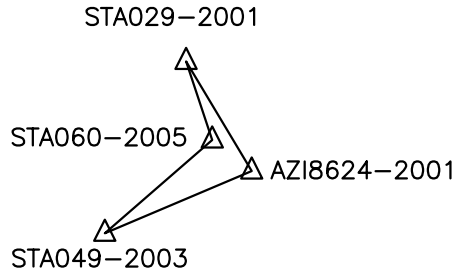
DATE: 6/23/2005

DRAWN: JAT

CHECKED: BTB

APPROVED: HLH

JOB No. 0260



GPS Loop # 2:					
STA 049-2003: AZI8624-2001: STA 029-2001: STA 060-2005: STA 049-2005					
Observations:					
Baseline ID	Solution ID	From	To	Solution Type	
B40	S2	STA 049-2003	AZI 8624-2001	L1 fixed	
B73	S3	AZI 8624-2001	STA 029-2001	L1 fixed	
B63	S20	STA 060-2005	STA 029-2001	L1 fixed	
B15	S19	STA 049-2003	STA 060-2005	L1 fixed	
Passed Combination for Loop 2:					
S2-S3-S20-S19					
		Length	Horiz	Vert	PPM
		48435.874 sft	0.016sft	-0.122sft	2.531



GPS NETWORK DENSIFICATION FOR
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STATIC NETWORK LOOP #2 CLOSURE

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(812) 288-6646



EXHIBIT
2 of 10

SCALE: 1" = 20000'

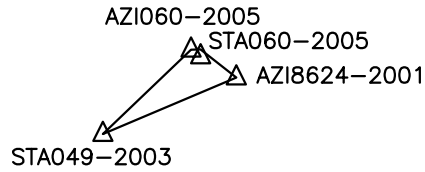
DATE: 6/23/2005

DRAWN: JAT

CHECKED: BTB

APPROVED: HLH

JOB No. 0260



GPS Loop # 3:				
STA049-2003: AZI8624-2001: STA060-2005: AZI060-2005: STA049-2003				
Observations:				
Baseline ID	Solution ID	From	To	Solution Type
B40	S2	STA 049-2003	AZI 8624.2001	L1 fixed
B52	S23	STA 060-2005	AZI 8624-2001	L1 fixed
B28	S22	AZI 060-2005	STA 060-2005	L1 fixed
B16	S21	STA 049-2003	AZI 060-2005	L1 fixed
Passed Combination for Loop 3:				
S2-S23-S22-S21				
		Length	Horiz	Vert
		33517.132sft	0.017sft	-0.075sft
				PPM
				2.303



GPS NETWORK DENSIFICATION FOR
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STATIC NETWORK LOOP #3 CLOSURE

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(812) 288-6646



EXHIBIT

3 of 10

SCALE: 1" = 20000'

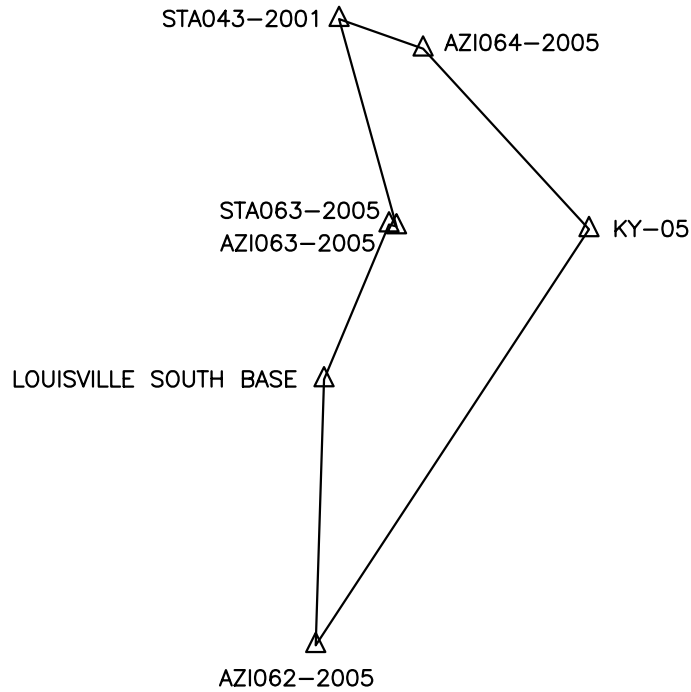
DATE: 6/24/2005

DRAWN: JAT

CHECKED: BTB

APPROVED: HLH

JOB No. 0260



GPS Loop # 4:				
STA043-2001: AZI063-2005: STA063-2005: LOUISVILLE SOUTH BASE: AZI062-2005:				
KY-05: AZI064-2005: STA043-2001				
Observations:				
Baseline ID	Solution ID	From	To	Solution Type
B33	S27	STA 043-2001	AZI 063-2005	Iono free fixed
B58	S80	STA 063-2005	AZI 063-2005	L1 fixed
B32	S35	LOUISVILLE SOUTH	STA 063-2005	Iono free fixed
B60	S64	LOUISVILLE SOUTH	AZI 062-2005	Iono free fixed
B71	S48	KY-05	AZI 062-2005	Iono free fixed
B22	S84	AZI 064-2005	KY-05	Iono free fixed
B9	S28	STA 043-2001	AZI 064-2005	L1 fixed
Passed Combination for Loop 4:				
S27-S80-S35-S64-S48-S84-S28				
		Length	Horiz	Vert
		155114.102sft	0.054sft	-0.029sft
				PPM
				0.395



GPS NETWORK DENSIFICATION FOR
LOUISVILLE/JEFFERSON COUNTY INFORMATION CONSORTIUM

STATIC NETWORK LOOP #4 CLOSURE

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(812) 288-6646



EXHIBIT
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SCALE: 1" = 20000'

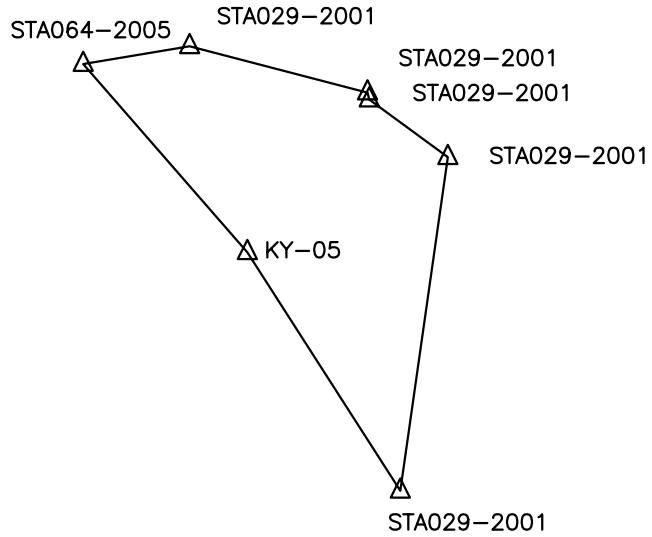
DATE: 6/24/2005

DRAWN: JAT

CHECKED: BTB

APPROVED: HLH

JOB No. 0260



GPS Loop # 5:				
GPS86-43 RESET: STA064-2005:KY-05: STA061-2005: BOWMAN-RESET: AZI065-2005:				
STA065-2005: GPS86-43 RESET				
Observations:				
Baseline ID	Solution ID	From	To	Solution Type
B7	S29	GPS86-43 RESET	STA 064-2005	L1 fixed
B31	S83	STA 064-2005	KY-05	Iono free fixed
B29	S41	STA 061-2005	KY-05	Iono free fixed
B5	S39	BOWMAN-RESET	STA 061-2005	Iono free fixed
B6	S36	BOWMAN-RESET	AZI 065-2005	L1 fixed
B54	S73	STA 065-2005	AZI 065-2005	L1 fixed
B43	S30	GPS86-43 RESET	STA 065-2005	Iono free fixed
Passed Combination for Loop 5:				
S29-S83-S41-S39-S36-S73-S30				
		Length	Horiz	Vert
		131914.864sft	0.087sft	-0.027sft
				PPM
				0.694

GPS NETWORK DENSIFICATION FOR
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STATIC NETWORK LOOP #5 CLOSURE

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CLARKSVILLE, INDIANA 47129
(812) 288-6646



EXHIBIT
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SCALE: 1" = 20000'

DATE:6/24/2005

DRAWN: JAT

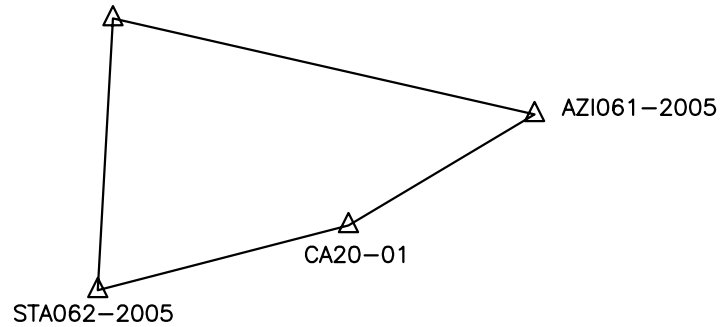
CHECKED: BTB

APPROVED: HLH

JOB No. 0260



LOUISVILLE SOUTH BASE



GPS Loop # 6:				
CA20-01: AZI061-2005: LOUISVILLE SOUTH BASE: STA062-2005: CA20-01				
Observations:				
Baseline ID	Solution ID	From	To	Solution Type
B62	S42	CA 20-01	AZI 061-2005	Iono free fixed
B26	S45	AZI 061-2005	LOUISVILLE SOUTH	Iono free fixed
B1	S62	STA 062-2005	LOUISVILLE SOUTH	Iono free fixed
B38	S43	CA 20-01	STA 062-2005	Iono free fixed
Passed Combination for Loop 6:				
S42-S45-S62-S43				
		Length	Horiz	Vert
		122945.799sft	0.016sft	0.002sft
			PPM	0.128



GPS NETWORK DENSIFICATION FOR
LOUISVILLE/JEFFERSON COUNTY INFORMATION CONSORTIUM

STATIC NETWORK LOOP #6 CLOSURE

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(812) 288-6646



EXHIBIT
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SCALE: 1" = 20000'

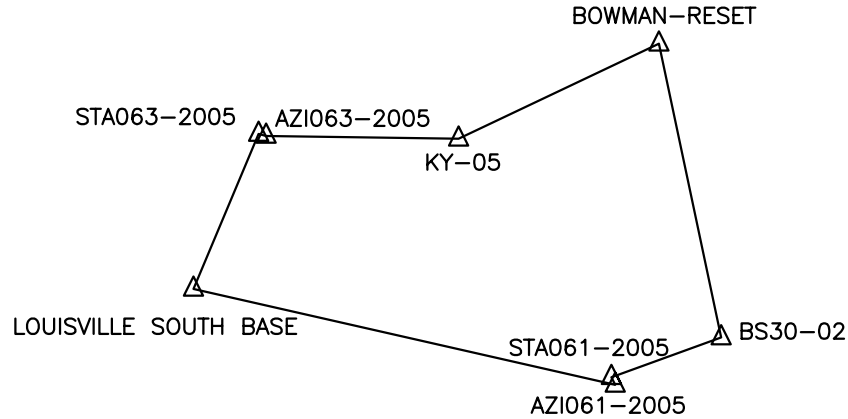
DATE: 6/24/2005

DRAWN: JAT

CHECKED: BTB

APPROVED: HLH

JOB No. 0260



GPS Loop # 7:				
LOUISVILLE SOUTH BASE: STA063-2005: AZI063-2005: KY-05: BOWMAN-RESET:				
BS 30-02: STA061-2005: AZI061-2005: LOUISVILLE SOUTH BASE				
Observations:				
Baseline ID	Solution ID	From	To	Solution Type
B32	S35	LOUISVILLE SOUTH	STA 063-2005	Iono free fixed
B58	S80	STA 063-2005	AZI 063-2005	L1 fixed
B34	S49	KY-05	AZI 063-2005	Iono free fixed
B17	S53	BOWMAN-RESET	KY-05	Iono free fixed
B41	S38	BOWMAN-RESET	BS 30-02	Iono free fixed
B53	S40	BS 30-02	STA 061-2005	L1 fixed
B4	S72	STA 061-2005	AZI 061-2005	L1 fixed
B26	S45	AZI 061-2005	LOUISVILLE SOUTH	Iono free fixed
Passed Combination for Loop 7:				
S35-S80-S49-S53-S38-S40-S72-S45				
		Length	Horiz	Vert
		150836.116sft	0.056sft	-0.037sft
				PPM
				0.442



GPS NETWORK DENSIFICATION FOR
LOUISVILLE/JEFFERSON COUNTY INFORMATION CONSORTIUM

STATIC NETWORK LOOP #7 CLOSURE

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(812) 288-6646



EXHIBIT

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SCALE: 1" = 20000'

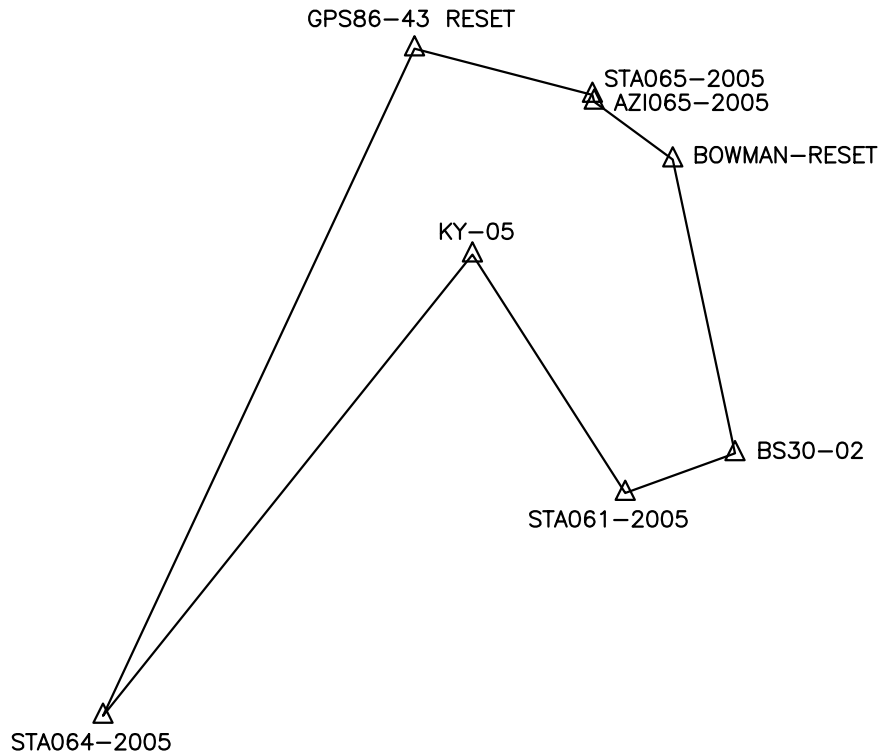
DATE: 6/24/2005

DRAWN: JAT

CHECKED: BTB

APPROVED: HLH

JOB No. 0260



GPS Loop # 8:				
GPS86-43 RESET: STA064-2005: KY-05: STA061-205:BS30-02: BOWMAN-RESET:				
AZI065-2005: STA065-2005: GPS 86-43 RESET				
Observations:				
Baseline ID	Solution ID	From	To	Solution Type
B7	S29	GPS 86-43 RESET	STA 064-2005	L1 fixed
B31	S83	STA 064-2005	KY-05	Iono free fixed
B29	S41	STA 061-2005	KY-05	Iono free fixed
B53	S40	BS 30-02	STA 061-2005	L1 fixed
B41	S38	BOWMAN-RESET	BS 30-02	Iono free fixed
B6	S36	BOWMAN-RESET	AZI 065-2005	L1 fixed
B54	S73	STA 065-2005	AZI 065-2005	L1 fixed
B43	S30	GPS 86-43 RESET	STA 065-2005	Iono free fixed
Passed Combination for Loop 8:				
S29-S83-S41-S40-S38-S36-S73-S30				
		Length	Horiz	Vert
		140254.002	0.088sft	-0.014sft
			PPM	0.634



GPS NETWORK DENSIFICATION FOR
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STATIC NETWORK LOOP #8 CLOSURE

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120 BELL AVENUE
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(812) 288-6646



EXHIBIT
8 of 10

SCALE: 1" = 20000'

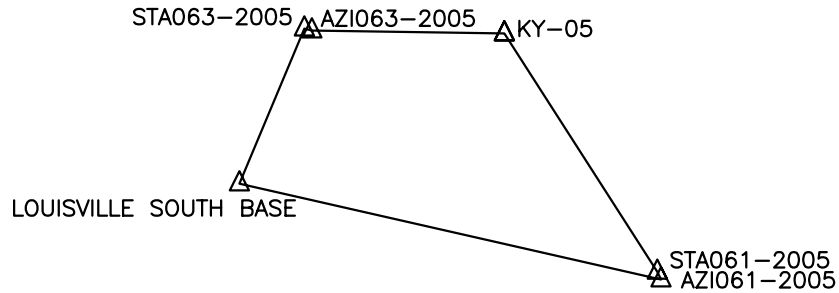
DATE: 6/24/2005

DRAWN: JAT

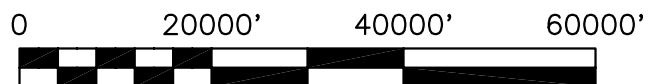
CHECKED: BTB

APPROVED: HLH

JOB No. 0260



GPS Loop # 9:					
LOUISVILLE SOUTH BASE: STA063-2005: AZI063-2005: KY-05: STA061-2005:					
AZI061-2005: LOUISVILLE SOUTH BASE:					
Observations:					
Baseline ID	Solution ID	From	To	Solution Type	
B32	S35	LOUISVILLE SOUTH	STA 063-2005	Iono free fixed	
B58	S80	STA 063-2005	AZI 063-2005	L1 fixed	
B34	S49	KY-05	AZI 063-2005	Iono free fixed	
B29	S41	STA 061-2005	KY-05	Iono free fixed	
B4	S72	STA 061-2005	AZI 061-2005	L1 fixed	
B26	S45	AZI 061-2005	LOUISVILLE SOUTH	Iono free fixed	
Passed Combination for Loop 9:					
S35-S80-S49-S41-S72-S45					
		Length	Horiz	Vert	PPM
		113801.029sft	0.015sft	-0.146sft	1.291



GPS NETWORK DENSIFICATION FOR
LOUISVILLE/JEFFERSON COUNTY INFORMATION CONSORTIUM

STATIC NETWORK LOOP #9 CLOSURE

JACOBI, TOOMBS & LANZ, INC.
CONSULTING ENGINEERS
120 BELL AVENUE
CLARKSVILLE, INDIANA 47129
(812) 288-6646



EXHIBIT
9 of 10

SCALE: 1" = 20000'

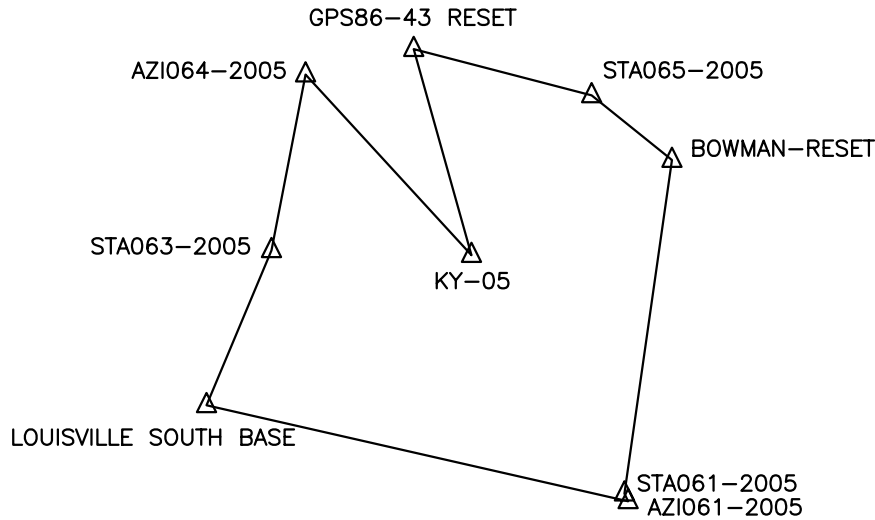
DATE: 6/24/2005

DRAWN: JAT

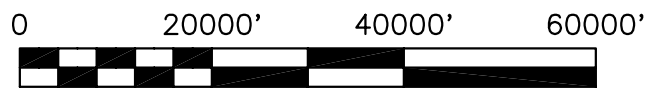
CHECKED: BTB

APPROVED: HLH

JOB No. 0260



GPS Loop # 10:				
GPS86-43 RESET: STA065-2005: BOWMAN-RESET: STA061-2005: AZI061-2005:				
LOUISVILLE SOUTH BASE: STA063-2005: AZI064-2005: KY-04: GPS86-43 RESET				
Observations:				
Baseline ID	Solution ID	From	To	Solution Type
B43	S30	GPS 86-43 RESET	STA 065-2005	Iono free fixed
B42	S37	BOWMAN-RESET	STA 065-2005	L1 fixed
B5	S39	BOWMAN-RESET	STA 061-2005	Iono free fixed
B4	S72	STA 061-2005	AZI 061-2005	L1 fixed
B26	S45	AZI 061-2005	LOUISVILLE SOUTH	Iono free fixed
B32	S35	LOUISVILLE SOUTH	STA 063-2005	Iono free fixed
B46	S50	STA 063-2005	AZI 064-2005	Iono free fixed
B22	S84	AZI064-2005	KY-05	Inon free fixed
B19	S31	GPS 86-43 RESET	KY-05	Iono free fixed
Passed Combination for Loop 10:				
S30-S37-S39-S72-S45-S35-S50-S84-S31				
		Length	Horiz	Vert
		194886.158sft	0.042sft	-0.120sft
				PPM
				0.654



GPS NETWORK DENSIFICATION FOR
LOUISVILLE/JEFFERSON COUNTY INFORMATION CONSORTIUM

STATIC NETWORK LOOP #10 CLOSURE

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120 BELL AVENUE
CLARKSVILLE, INDIANA 47129
(812) 288-6646



EXHIBIT
10 of 10

SCALE: 1" = 20000'

DATE: 6/24/2005

DRAWN: JAT

CHECKED: BTB

APPROVED: HLH

JOB No. 0260