

Ref: CASE: 3:14-CV-02551-JZ Doc #5 Filed: 01/13/15

1 of 64. Page ID #212

Previous Calendar half year "Progress Report Period" 1/1/16 to 6/30/16

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Paragraph 33 of the Lima Consent Decree "CD") states that, on January 31 and July 31 after the Effective Date and continuing on January 31 and July 31 of each year until termination of the CD, Lima shall submit to USEPA and Ohio EPA a progress report regarding the implementation of the requirements of this Decree in the previous calendar half year ("Progress Report").

The lettered paragraphs below parallel the format of paragraph 33 of the CD.

- a. A statement setting forth the deadlines and other terms that Lima is or was required to meet by this Consent Decree since the date of the last Progress Report, whether and to what extent Lima has met these requirements, and the reasons for any noncompliance:

Lima Progress Report:

- (1) January 31, 2016 --- Required bid date for the Headworks Improvements Project. This was completed on 5/15/15. Full operation is required by 7/1/18.
- (2) June 30, 2016 --- Required completion date for the Supplemental Environmental Project (SEP). Project completed on time.

- b. A general description of the projects and activities conducted during the reporting period to comply with the requirements of this Decree, and a projection of work to be performed pursuant to this Consent Decree during the next reporting period. Notification to USEPA and Ohio EPA of any anticipated delay shall not, by itself, excuse the delay:

Lima Progress Report: Lima currently has the following contracts underway:

1. **Lima Wastewater Treatment Headworks Project** -- Commenced construction on July 1, 2015. The following is a list of items in progress or completed:

Entity: Lima
Doc Type: CD Rpt
Doc Subtype: _____
Program: NPDES
County: Allen
Secondary ID: 22600000

- a. Two bar screens in service, two bar screens in progress
- b. Primary tanks #1 and #2 completed, expected service date 8/1/16
- c. Aerated grit tanks #1 and #2 completed, expected service date 8/1/16
- d. Primary sludge pump station complete, expected service date 8/1/16
- e. Secondary effluent pump station construction in progress
- f. Chlorine contact chamber construction in progress

See attached Gantt chart for anticipated progress in the next 6 months.

2. **Upstream Regulator Project** -- Installation of all sanitary sewers, storm sewers, manholes and catch basins is complete. All curb and gutter repair, street resurfacing

and landscaping is complete. Work items expected to be completed during the reporting period include the weir wall modification at CSO #38 and planting of 12 trees in Faurot Park. This project is approximately 98% complete and is on schedule for full operation by June 30, 2017.

3. **CMOM Plan Development** – The CMOM plan was submitted to USEPA and OEPA on July 10, 2015. Lima will implement the plan within 30 days of agency approval. To date Lima has not received a response from the agency on the submittal.
 4. **Asset Management** – Flow meters were installed at the intersection of High Street and Rosedale Avenue and the intersection of High Street and Cole Street, for a two month period beginning 2/18/16. Data collected from the meters is being used to calibrate the hydraulic model and verify the preliminary engineering recommendations. On 4/4/16, the City undertook a three week project to clean and inspect 2,172 feet of 54" sewer and 550 feet of 78" sewer on High Street and Jameson Avenue as part of the Phase 1 Rehabilitation project. On 6/2/16, data files from a rain gage at the WWTP were sent to MWH to further calibrate the hydraulic model. Progress over the next six months is expected to include completion of final design and development of bid documents for this Phase 1 Rehabilitation project.
 5. The City of Lima contracted with Geosyntec Consultants, Ann Arbor, Michigan, to complete the environmental components of the **Supplemental Environmental Project (SEP)**.
 6. **Simmon's Field CSO EQ Basin** -- The City authorized a contract with MWH Engineers on 2/8/16 for a preliminary engineering study. A kick-off meeting was conducted on 4/5/16.
- c. A summary of all material problems or potential problems encountered during the reporting period, and the actions taken to rectify the problems:

Lima Progress Report:

1. None noted.

- d. A summary of all material contacts with USEPA and Ohio EPA during the reporting period, including but not limited to the date deliverables under this Decree were sent to USEPA and Ohio EPA:

Lima Progress Report:

1. March 1, 2016 -- Underground Utilities, on behalf of the City of Lima and as part of the Upstream Regulator Sewer Separation Project, received authorization from OEPA to conduct construction activity at the Collett Street City Dump site pursuant to OAC 3745-27-13.

2. March 17, 2016 --- Lima received a Preliminary Compliance Review letter from OEPA indicating a weekly average limit violation for TSS at Station 604.
3. March 18, 2016 --- Lima submitted a response letter to OEPA concerning the weekly average limit violation.
4. April 25, 2016 --- Lima submitted a letter of explanation to OEPA concerning a potential accidental discharge of Sodium Hypochlorite from the WWTP on April 14, 2016.
5. April 27, 2016 --- Lima received a Fact Sheet and NPDES Draft permit from OEPA for an initial 14-day review.
6. May 12, 2016 --- Lima submitted a follow-up letter to OEPA concerning the Sodium Hypochlorite discharge.
7. May 23, 2016 --- Lima submitted a letter to OEPA containing its preliminary comments to the draft NPDES permit.
8. June 1, 2016 --- Lima received an NOV letter from OEPA concerning the Sodium Hypochlorite discharge.
9. June 6, 2016 --- Lima submitted a notification letter to OEPA informing of a daily maximum limit exceedance of Total Residual Chlorine at Station 001.
10. June 10, 2016 --- Lima submitted a letter to OEPA requesting a change in the Operator of Record at the WWTP.
11. June 15, 2016 --- Lima submitted a response letter to OEPA concerning the June 1 Sodium Hypochlorite NOV.

Note: As to the June 1 Sodium Hypochlorite NOV, there was a subsequent letter from OEPA on July 11, and a response by the City on July 25. The NOV is now resolved.

e. A statement of any exceedances of NPDES permit limitations:

Lima Progress Report:

1. February, 2016 --- Lima's WWTP had an exceedance of the weekly average limit of 20 mg/l for Total Suspended Solids at Station 604. Lima recorded an average of 25.47 mg/l for the week of February 21-28, 2016. This exceedance was due to a significant rain event that occurred on 2/24/16. The high flows from the rain event, in conjunction with the headworks construction currently underway at the plant, limited the capacity of the plant to process the suspended solids.
2. June 6, 2016 --- Lima's WWTP had an exceedance of the daily maximum limit of 0.02 mg/l for Total Residual Chlorine at Station 001. Lima recorded 0.3 mg/l. This exceedance was due to inadequate adjustment of the chlorine feed rate as flows decreased following a rain event.

Operator training measures have been instituted to provide more effective response as flows increase and decrease at the plant.

- f. A summary of all CSO Discharges, SSOs, Bypasses, and other unpermitted discharges occurring within the reporting period including the actual or estimated frequency, duration and volume of each CSO Discharge, SSO, Bypass, and other unpermitted discharge:

Lima Progress Report:

1. Water-in-Basement (WIB) Events --- Lima recorded 5 instances of WIB due to surcharge conditions in the mainline. The City continues to work with homeowners that experience chronic flooding on a case-by-case basis through a WIB Program that raises the lateral to a higher elevation and separates the storm water from the sanitary. Lima completed 3 WIB projects over the last six month period. Two additional project bids have been awarded and are expected to be completed in the next reporting period.
 2. SSO & CSO Monthly Reporting -- See attached Overflow Totals Report. These numbers are reported monthly to OEPA as part of the monthly Discharge Monitoring Report.
- g. A section containing a report on Lima's CMOM Program, as required by Paragraph 19.

CMOM PROGRAM REPORT

Paragraph 19

Summarize the activities performed during the previous six month period to implement the approved CMOM Program including, but not limited to:

- a. Describe Sewer System Cleaning, including:
 - (1) Provide the total unique miles of sewer cleaned and percentage of system cleaned (with repeat cleaning of the same sewer segment not counted toward the total mileage)

Lima Progress Report:

From 1/1/16 to 6/30/16

40,202 linear feet = 7.61 miles (7.6.% of SSS)

- (2) List hotspot locations and the frequency that those sewer segments were cleaned:

Lima Progress Report:

Lima's "High Maintenance List" (i.e., hot spots) of sanitary sewers was completed on May 26, 2016. This list includes 39,022 feet (7.39 miles - 7.4% of SSS) of sewers that are susceptible to higher levels of grease and debris buildup. See Attachment B.

- b. Describe and Quantify the total mileage of internal sewer inspections, such as by CCTV:

Lima Progress Report:

Jan 1, 2016 – June 30, 2016

25,903 linear feet of CCTV Inspection= 4.9 miles (4.9% of SSS)

81 Manholes Inspected

- c. Describe the rehabilitation and replacement work within the Sewer System started and completed or identified for future scheduling:

Lima Progress Report:

1. Rehabilitated 12 manholes (Mr. Manhole, repair casting, etc.)
2. Installed 9 new manholes
3. Installed 2,025 feet of 15-inch PVC sanitary sewer
4. Installed 254 feet of 10-inch PVC sanitary sewer

- d. Describe operational changes or improvements implemented as part of the approved CMOM:

Lima Progress Report:

The CMOM Program Plan was submitted to USEPA and Ohio EPA on June 10, 2015, but it has not yet been approved.

- e. Identify any cross-connections detected or eliminated and dye testing or clear water source elimination measures implemented:

Lima Progress Report: None.

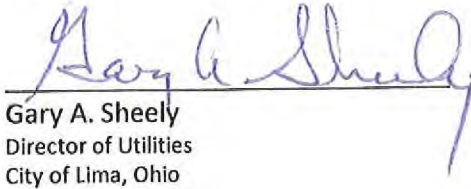
- f. Identify the cause and corrective maintenance response taken to any SSOs that occurred:

Lima Progress Report:

All of the 40 SSOs cited on the overflow report were directly related to rainfall events. In such events where the sewer system is stressed beyond capacity, city personnel manage the pump stations and WWTP via SCADA to maintain maximum treatment capability. The SSOs only activate to decrease occurrences of basement flooding.

In cases that involve structural failure of sewer system components or mechanical/electrical failure of equipment, a 24-hour emergency response crew is dispatched to address the situation.

I certify under penalty of law that the information contained in or accompanying this (submission/document) is true, accurate and complete. As to (the/those) identified portion(s) of this (submission/document) for which I cannot personally verify (its/their) truth and accuracy, I certify as the official having supervisory responsibility for the person (s) who, acting under my direct instructions, made the verification, that this is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.



Gary A. Sheely
Director of Utilities
City of Lima, Ohio

cc: David J. Berger, Lima City Mayor
Fred P. Andes, Barnes & Thornburg LLP
Stephen P. Samuels, Frost Brown Todd LLC
File

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						2017																		
						JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	D
						2016																		
						JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	D
Activity ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish																			
GENERAL REQUIREMENTS																								
1020	PLANNED PHASE I SUBSTANTIAL COMPLETION	1	1	01AUG16	01AUG16																			
1030	PLANNED PHASE II SUBSTANTIAL COMPLETION	1	1	14FEB17	14FEB17																			
1040	PUNCH LIST	20	20	15MAY17	09JUN17																			
1070	PLANNED FINAL COMPLETION	1	1	12JUN17	12JUN17																			
SITEWORK																								
2360	UNDERGROUND ELEC TO SEC EFFL PS	10	10	28JUN16	12JUL16																			
2370	SOUTH UNDERGROUND FERROUS	10	10	29JUN16	12JUL16																			
1120	TEMP SLG/SCUM PIPING AT PSPS	2	2	29JUL16	01AUG16																			
1240	TEMP PUMP FROM MH-16 TO PIS #3	15	15	02AUG16	22AUG16																			
2180	TEMP PUMP RECYCLE FROM 21" TO PSPS	15	15	02AUG16	22AUG16																			
1110	24" & 12" RECYCLE PIPING	10	10	24AUG16	06SEP16																			
1130	NEW SLG/SCUM WEST OF PSPS	6	6	07SEP16	14SEP16																			
1230	PT #3, 4 EFFLUENT PIPING	10	10	20DEC16	02JAN17																			
1160	10" TANK DRAIN	5	5	03JAN17	09JAN17																			
1170	8" SCUM FROM PSPS TO HEADWORKS	5	5	10JAN17	16JAN17																			
1180	NORTH STORM SEWERS	5	5	17JAN17	23JAN17																			
1220	NORTH UNDERGROUND FERROUS	5	5	24JAN17	30JAN17																			
1180	NORTH CW & EW LINES	10	10	31JAN17	13FEB17																			
2350	UNDERGROUND ELEC TO PSPS	5	5	14FEB17	20FEB17																			
1050	SITE CONCRETE	20	20	01MAY17	26MAY17																			
1260	SITE STONE	5	5	22MAY17	28MAY17																			
1050	ASPHALT	10	10	29MAY17	09JUN17																			
HEADWORKS SCREEN BLDG ADDITION																								
2000	PAINTING	35	5	02DEC15A	21JUN16																			
2060	CAULKING	5	2	04DEC15A	16JUN16																			
1990	STAIR S-13/14 & LANDINGS	5	5	15JUN16	21JUN16																			
2080	SCUM SCREEN	1	1	15JUN16	15JUN16																			
2120	REMOVE PLATE TO NORTH GRIT TANKS	1	1	07FEB17	07FEB17																			
EXISTING SCREEN BLDG																								
2280	ELECTRICAL	30	3	18MAR16A	17JUN16																			
2270	PAINTING	20	1	10MAY16A	15JUN16																			
2300	METALS	10	1	10MAY16A	15JUN16																			
2810	INSTALL TEMP BULKHEAD IN BYPASS CHANNEL	1	1	01AUG16*	01AUG16																			
2300	DEMO NORTH SLIDE GATE & CONCRETE	5	5	14FEB17	20FEB17																			
2320	REMOVE TEMP BULKHEAD IN BYPASS CHANNEL	1	1	14FEB17	14FEB17																			
SOUTH GRIT TANKS																								
2720	ELECTRICAL	25	12	10MAY16A	30JUN16																			
2670	PAINTING	20	6	18MAY16A	22JUN16																			
2680	METALS	10	5	01JUN16A	21JUN16																			
2710	SMALL PIPING	5	1	01JUN16A	15JUN16																			
2640	PIPE CHASE MASONRY	7	7	15JUN16	23JUN16																			
2610	VALVE VAULT BACKFILL	2	2	15JUN16	16JUN16																			
2650	PIPE CHASE PRECAST PLANK	1	1	21JUN16	21JUN16																			
2740	TEMP BULKHEAD AT STOP PLANK GROOVES	1	1	22JUN16	22JUN16																			
2660	PIPE CHASE ROOF	2	2	22JUN16	23JUN16																			
2760	START-UP	14	14	05JUL16*	22JUL16																			
3190	REMOVE TEMP BULKHEAD AT STOP PLANK GROOVES	1	1	03JAN17	03JAN17																			
NORTH GRIT TANKS																								
2790	EXCAVATE/SHORING	15	15	17AUG16	06SEP16																			
2850	MUDMAT AT 83.75	1	1	07SEP16	07SEP16																			
2860	SLAB AT 83.75	3	3	08SEP16	12SEP16																			
2870	MUDMAT AT 85.25	1	1	13SEP16	13SEP16																			

Sheet 1 of 6

PETERSON/URS
LIMA WWTP HEADWORKS
Classic Schedule Layout

Start Date
Finish Date
Date Date
Run Date

15JUN16
15JUN16
15JUN16 11:14

Early Bar
Progress Bar
Critical Activity

Date	Revision	Checked	Approved

						2017																											
						JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	D									
						2016																											
						JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	D									
Activity ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish																												
2880	SLAB AT 85.25		5	14SEP16	20SEP16																												
2890	FIRST LIFT WALLS	10		10/21SEP16	04OCT16																												
2940	SPECIAL BACKFILL UNDER TANK SLAB	3		3/05OCT16	07OCT16																												
3110	BACKFILL UNDER 89.75 SLAB	3		3/05OCT16	07OCT16																												
2950	MUDMAT UNDER TANK SLAB	2		2/10OCT16	11OCT16																												
2900	EFFLUENT CHANNEL MUDMAT AT 89.75	2		2/10OCT16	11OCT16																												
2990	SLOPING TANK SLAB	8		8/12OCT16	21OCT16																												
2910	EFFLUENT CHANNEL SLAB AT 89.75	5		5/12OCT16	18OCT16																												
3100	EFFLUENT CHANNEL WALLS	10		10/19OCT16	01NOV16																												
2970	TANKS WALLS - 2ND LIFT	20		20/24OCT16	18NOV16																												
2900	BACKFILL	10		10/21NOV16	02DEC16																												
2990	INFLUENT CHANNEL MUDMAT	1		1/28NOV16	28NOV16																												
3000	INFLUENT CHANNEL SLAB AT 94.92	5		5/29NOV16	05DEC16																												
3040	VALVE VAULT MUDMAT AT 94.58	1		1/30NOV16	30NOV16																												
3050	VALVE VAULT SLAB AT 94.58	6		6/01DEC16	08DEC16																												
3050	BYPASS CHANNEL MUDMAT AT 96.92	1		1/05DEC16	05DEC16																												
3050	BYPASS CHANNEL SLAB AT 96.92	6		6/05DEC16	13DEC16																												
3010	INFLUENT CHANNEL WALLS	6		6/06DEC16	13DEC16																												
3020	INFLUENT CHANNEL SLAB AT 97.06	2		2/08DEC16	09DEC16																												
3060	VALVE VAULT WALLS	7		7/09DEC16	18DEC16																												
3570	BYPASS CHANNEL WALLS	7		7/14DEC16	22DEC16																												
3030	INFLUENT CHANNEL DECK	10		10/14DEC16	27DEC16																												
3070	VALVE VAULT FLANGE DIP	4		4/20DEC16	23DEC16																												
3580	BYPASS & EFFLUENT CHANNEL DECK	10		10/23DEC16	01JAN17																												
3150	PUMPS/FLANGE DIP IN TANKS	6		6/26DEC16	02JAN17																												
3080	VALVE VAULT DECK	10		10/26DEC16	06JAN17																												
3170	ELECTRICAL	25		25/03JAN17	08FEB17																												
3120	PAINTING	20		20/03JAN17	30JAN17																												
3530	GATES	2		2/03JAN17	04JAN17																												
3180	SS AIR PIPING	6		6/05JAN17	12JAN17																												
3590	BYPASS CHANNEL BACKFILL	5		5/08JAN17	12JAN17																												
3090	VALVE VAULT BACKFILL	2		2/09JAN17	10JAN17																												
3130	METALS	10		10/13JAN17	26JAN17																												
3160	SMALL PIPING	5		5/13JAN17	19JAN17																												
3600	SIDEWALKS BETWEEN TANKS	5		5/13JAN17	19JAN17																												
3140	FRP	2		2/27JAN17	30JAN17																												
3540	START-UP	5		5/07FEB17	13FEB17																												
PRIMARY INFLUENT CHANNEL																																	
3290	AIR PIPING	5		5/21JUN16A	16JUN16																												
3280	BACKFILL	5		5/15JUN16	21JUN16																												
3300	METALS	2		2/15JUN16	16JUN16																												
3520	READY FOR SERVICE	1		1/22JUN16	22JUN16																												
PRIMARY TANK #1																																	
3440	PAINT SCUM PIPE	1		1/15JUN16*	15JUN16																												
3450	START-UP	2		2/12JUL16*	13JUL16																												
PRIMARY TANK #2																																	
4010	PAINT SCUM PIPING	1		1/15JUN16*	15JUN16																												
4020	START-UP	2		2/12JUL16	13JUL16																												
PRIMARY SLUDGE PUMP STATION																																	
5370	ELECTRICAL	30		12/25APR16A	30JUN16																												
5290	SMALL PIPING/PLUMBING/HVAC	20		10/25APR16A	25JUN16																												
5830	PAINTING	20		5/25APR16A	21JUN16																												
5860	METALS	10		3/25APR16A	17JUN16																												
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Activity ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish																																
5820	CAULKING	5		5/15/JUN/16	21/JUN/16																																
5190	DOORS	2		2/01/JUL/16	04/JUL/16																																
6690	START-UP	15		15/11/JUL/16*	29/JUL/16																																
7820	CONNECT YARD SLUDGE & SCUM AT PT #3, 4	5		5/15/NOV/16	21/NOV/16																																
PRIMARY TANK #3																																					
4330	EXCAVATE EARTH	10		10/07/SEP/16	20/SEP/16																																
4340	ROCK EXCAVATION	4		4/21/SEP/16	28/SEP/16																																
4350	36" DIP	3		3/27/SEP/16	29/SEP/16																																
4370	CENTER HUB	5		5/30/SEP/16	06/OCT/16																																
4380	MUDMAT	2		2/07/OCT/16	10/OCT/16																																
4390	BASE SLAB	10		10/11/OCT/16	24/OCT/16																																
4390	8" SLUDGE	1		1/10/OCT/16	18/OCT/16																																
4400	WALLS	15		15/15/OCT/16	14/NOV/16																																
4420	TROUGH SLAB/WALLS	15		15/15/NOV/16	05/DEC/16																																
4410	BACKFILL	15		15/15/NOV/16	05/DEC/16																																
5050	PRV PIPING	5		5/24/NOV/16	30/NOV/16																																
4430	SET MECHANISM	10		10/06/DEC/16	19/DEC/16																																
5070	SMALL PIPING	10		10/06/DEC/16	19/DEC/16																																
5080	MOUNT PRV'S	3		3/06/DEC/16	08/DEC/16																																
4450	SCUM PIPE	2		2/20/DEC/16	21/DEC/16																																
4440	ELECTRICAL	10		10/20/DEC/16	02/JAN/17																																
5040	FRP WEIRS/BAFFLES	8		8/22/DEC/16	02/JAN/17																																
4460	PAINT SCUM PIPE	8		8/22/DEC/16	02/JAN/17																																
5090	STAIRS	3		3/03/JAN/17	05/JAN/17																																
4470	START-UP	2		2/27/JAN/17	30/JAN/17																																
PRIMARY TANK #4																																					
4480	EXCAVATE EARTH	10		10/21/SEP/16	04/OCT/16																																
4490	ROCK EXCAVATION	4		4/05/OCT/16	10/OCT/16																																
4500	36" DIP	3		3/11/OCT/16	13/OCT/16																																
4520	CENTER HUB	5		5/14/OCT/16	20/OCT/16																																
4510	MUDMAT	2		2/21/OCT/16	24/OCT/16																																
4530	BASE SLAB	10		10/25/OCT/16	07/NOV/16																																
4540	8" SLUDGE	1		1/01/NOV/16	01/NOV/16																																
4550	WALLS	15		15/15/NOV/16	05/DEC/16																																
4560	BACKFILL	10		10/06/DEC/16	19/DEC/16																																
4570	TROUGH SLAB/WALLS	15		15/06/DEC/16	26/DEC/16																																
4640	PRV PIPING	5		5/08/DEC/16	14/DEC/16																																
4580	SET MECHANISM	10		10/27/DEC/16	09/JAN/17																																
5100	SMALL PIPING	10		10/27/DEC/16	09/JAN/17																																
5090	MOUNT PRV'S	3		3/27/DEC/16	29/DEC/16																																
4600	SCUM PIPE	2		2/10/JAN/17	11/JAN/17																																
4590	ELECTRICAL	10		10/10/JAN/17	23/JAN/17																																
4630	FRP WEIRS/BAFFLES	8		8/12/JAN/17	23/JAN/17																																
4610	PAINT SCUM PIPE	1		1/12/JAN/17	12/JAN/17																																
5110	STAIRS	3		3/24/JAN/17	26/JAN/17																																
4620	START-UP	2		2/27/JAN/17	30/JAN/17																																
PRIMARY OVERFLOW STRUCTURE																																					
4660	SHUT DOWN ALL EXISTING PRIMARY TANKS	1		1/02/AUG/16	02/AUG/16																																
4680	INSTALL TEMP BULKHEAD SOUTH OF SP-5	1		1/02/AUG/16	02/AUG/16																																
4690	SUPPLEMENTAL TEMP PUMP PRIMARY INFLUENT	23		23/02/AUG/16	01/SEP/16																																
4700	SECTION I-H-T WALL	5		5/03/AUG/16	09/AUG/16																																
4720	DEMO PORTION OF EFFLUENT FLUME - SHT #59	5		5/03/AUG/16	09/AUG/16																																
4710	(3) AREAS OF GRATING REMAB	5		5/03/AUG/16	09/AUG/16																																
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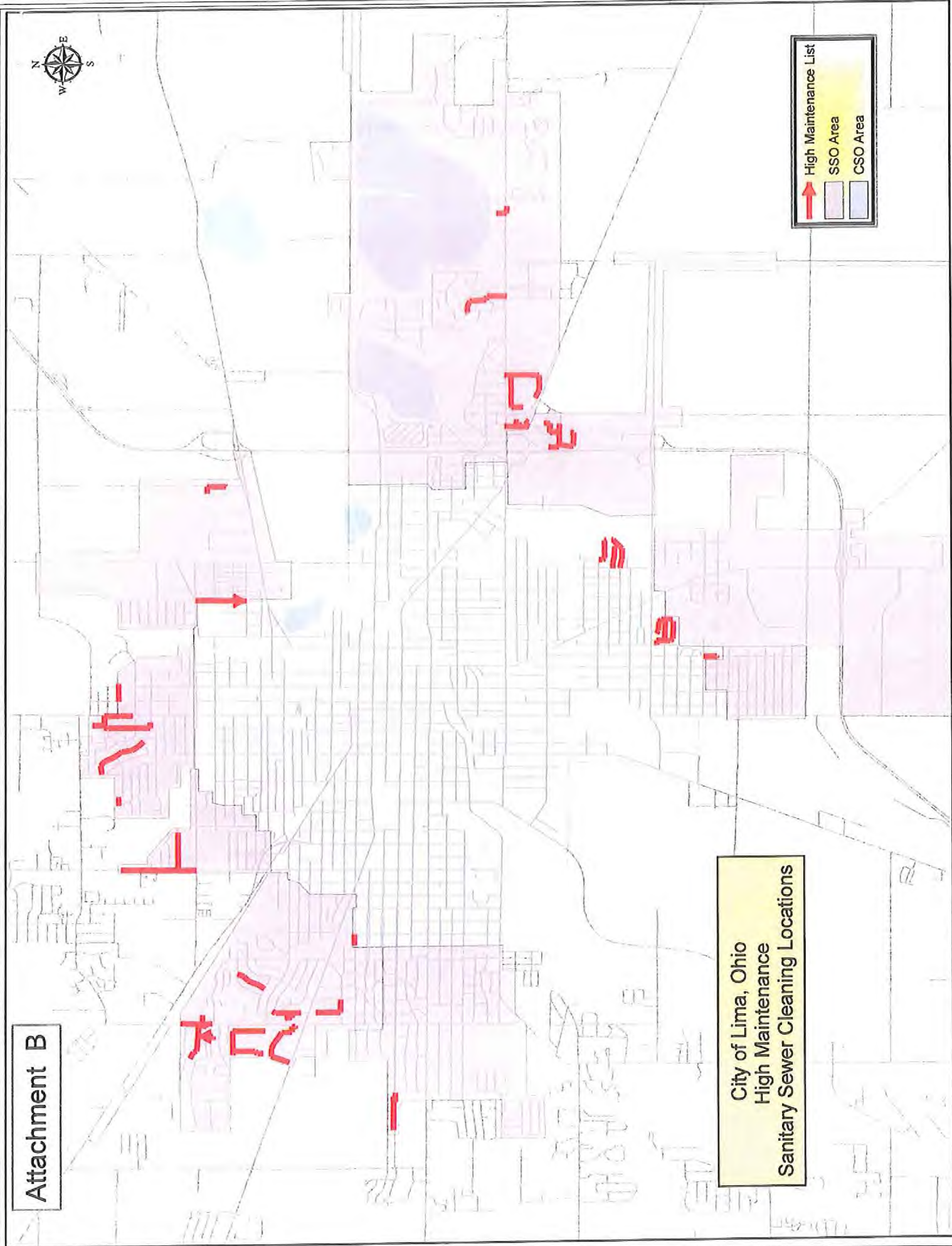
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5810	PUT EFFLUENT PUMP STATION BACK IN SERVICE	1	1	30DEC16	30DEC16																																
5720	NEW STORM WATER PUMP/FLG DIP	10	10	02JAN17	13JAN17																																
5770	START-UP NEW STORM WATER PUMP	1	1	16JAN17	16JAN17																																
5730	NEW PLANT WATER PUMP/FLG DIP	10	10	16JAN17	27JAN17																																
5710	20" FLANGE STORM WATER	5	5	24JAN17	30JAN17																																
5760	FSG-48	2	2	31JAN17	01FEB17																																
OUTFALL																																					
5960	LANDINGS	5	5	15JUN16	21JUN16																																
5970	METALS	5	5	22JUN16	28JUN16																																
DISINFECTION BLDG/CHANNELS																																					
6220	ROOFING	10	10	07JUN16A	17JUN16																																
6140	B-36 BEAMS	10	10	15JUN16	28JUN16																																
6230	FRP	5	5	15JUN16	21JUN16																																
6340	SPILL CONTAINMENT MUD VALVE	1	1	15JUN16	15JUN16																																
6650	SPILL CONTAINMENT METALS	3	3	16JUN16	20JUN16																																
7080	CAULKING	5	5	20JUN16	24JUN16																																
6240	METALS	5	5	22JUN16	28JUN16																																
6280	SMALL PIPING/PLUMBING/HVAC	20	20	01AUG16	28AUG16																																
6270	ELECTRICAL	25	25	01AUG16	02SEP16																																
6250	PAINTING	20	20	01AUG16	28AUG16																																
6300	START-UP	5	5	05SEP16	09SEP16																																
6280	DOORS	2	2	05SEP16	06SEP16																																
SECONDARY EFFLUENT PUMP STATION																																					
6500	ROOF SUPPORT STEEL	2	1	15JUN16A	16JUN16																																
6540	SET MCC'S	1	1	15JUN16	15JUN16																																
6490	PRECAST PLANK	2	2	17JUN16	20JUN16																																
6510	ROOFING	5	5	21JUN16	27JUN16																																
6560	ELECTRICAL	15	15	28JUN16	18JUL16																																
6570	PLUMBING/SMALL PIPING/HVAC	10	10	28JUN16	11JUL16																																
7430	PAINTING	10	10	28JUN16	11JUL16																																
7090	CAULKING	5	5	28JUN16	04JUL16																																
6550	DOORS	1	1	19JUL16	19JUL16																																
6580	START-UP	5	5	02NOV16*	08NOV16																																
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6650	ELECTRICAL	5	5	15JUN16	21JUN16																																
6630	MANHOLE STEPS	1	1	15JUN16	15JUN16																																
BLOWER BLDG																																					
7060	FLANGE DIP	10	10	15SEP16	28SEP16																																
7070	ELECTRICAL	10	10	29SEP16	12OCT16																																
EFFLUENT STRUCTURE #4																																					
7170	PLATE OVER 48" EAST	1	1	09NOV16	09NOV16																																
7410	FINAL CLARIFIERS #1, 4 OUT OF SERVICE	6	6	09NOV16	16NOV16																																
7180	REMOVE PLATE	1	1	17NOV16	17NOV16																																
7160	REPLACE TOP SLAB	10	10	18NOV16	01DEC16																																
DIGESTER #1																																					
7190	REMOVE SLUDGE	10	10	17OCT16*	28OCT16																																
7200	DEMOLITION	5	5	31OCT16	04NOV16																																
7210	NEW MIXER	5	5	08JAN17	13JAN17																																
7220	METALS	5	5	16JAN17	20JAN17																																
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7250	REMOVE SLUDGE	10	10	03APR17	14APR17																																
7260	DEMOLITION	5	5	17APR17	21APR17																																
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OUTFALL																																					

Attachment B



City of Lima, Ohio
High Maintenance
Sanitary Sewer Cleaning Locations



SSO & CSO Overflow Totals								
January 1 - June 30, 2016								
Annual Report #	EPA ID #	Location of Overflow		SSO	CSO			
302	2PE00000047	MH#14 on Lost Creek Golf Course	SSO	2				
007	2PE00000007	S. Central Ave. & Ottawa River	CSO		2			
008	2PE00000008	Timberlake Sewer & Ottawa River	CSO		2			
009	2PE00000009	Oxford Ave. & Collett Street	CSO					
037	2PE00000037	North Shore Dr. & Cole St.	CSO		2			
035	2PE00000035	Lakewood Ave & Charles St.	CSO		1			
034	2PE00000034	Judkins Ave at Kunneke Ave	CSO		1			
033	2PE00000033	Nixon Ave. at Kunneke Ave.	CSO		1			
303	2PE00000029	Glenwood Ave. between Lakewood and Wales Ave.	SSO	4				
304	2PE00000028	S. Pears Ave. at Kunneke Ave.	SSO					
305	2PE00000027	Lakewood Ave. & Maplewood Drive	SSO					
306	2PE00000026	S. Pears Ave. between Wendell Ave & Lakewood Ave.	SSO	1				
307	*****	418 South Pears (MH 0-10)	SSO					
308	2PE00000025	S. Pears Ave. between Lowell Ave. & Wendell Ave.	SSO	1				
309	2PE00000023	S. Pears Ave. between W. Spring & W. Elm St	SSO	1				
310	2PE00000024	Between W. Spring & W. Elm, East of Primrose Pl	SSO					
311		1861 Wendell	SSO					
313	2PE00000031	S. Cable Rd. at Lakewood Ave.	SSO	4				
314	2PE00000032	S. Cable Rd. at Wendell Ave.	SSO	3				
316	2PE00000022	Dale Dr. & Idlewild Dr.	SSO					
317	2PE00000020	Dale Dr. between W. Wayne & Oakland Pkwy	SSO	3				
318	2PE00000021	Dale Dr. & West Wayne St.	SSO	2				
319	2PE00000018	University Ave. & Dale Dr.	SSO	3				
320	*****	Columbia @ Allentown, MH #92	SSO	3				
321	2PE00000051	1379 N. Cable Road Lift Station (Check Valve)	SSO					
322	2PE00000050	1700 Allentown Road Lift Station (Check Valve)	SSO	1				
323	*****	Rosedale @ Ellison Ave.	SSO					
324	*****	Woodlawn @ Ellison Ave.	SSO	1				
325	2PE00000017	Woodlawn Ave. & Feeman Ave.	SSO	1				
014	2PE00000014	Metcalf St. & Tremont Ave.	CSO		3			
016	2PE00000016	Metcalf St. & Ashton Ave.	CSO		2			
015	2PE00000015	Metcalf St. & Runyan Ave.	CSO					
038	2PE00000038	West & O'Connor Ave	CSO					
012	2PE00000012	McDonel St. & O'Connor Ave.	CSO					
011	2PE00000011	Burch Ave. & O'Connor Ave.	CSO		1			
013	2PE00000013	Metcalf St. & O'Connor Ave.	CSO		1			
326	2PE00000010	Northwold St. & O'Connor Ave.	SSO					
327	2PE00000049	1330 Melrose Ave.	SSO					
329	2PE00000042	Metcalf St. & Lane Ave.	SSO					
330	2PE00000044	Metcalf St. & Ford Ave.	SSO					
331	*****	Burch & Ford	SSO					
332	2PE00000046	2032 Burch Ave.	SSO	1				
333	2PE00000045	Burch Ave. & Lewis Ave.	SSO					
334	2PE00000043	Metcalf St. & Lewis Blvd.	SSO					
335	2PE00000041	Celia Place & Northern Ave.	SSO	2				
336	2PE00000039	Karen St. & Lewis Blvd. (N)	SSO	4				
337	2PE00000038	Karen St. & Lane Ave	SSO	3				
338	2PE00000056	West St. Lift Station	SSO					
Overflow Totals =				40	16			
Report Updated on ...7/8/16				SSO	CSO			

RECEIVED

AUG 01 2016

OHIO E.P.A.
N.W.D.O.

Supplemental Environmental Project Ottawa River, Lima, Ohio

July 29, 2016

Submitted to

Lima, Ohio

Submitted by

Geosyntec 
consultants

engineers | scientists | innovators

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1. Introduction

The Federal Consent Decree (3:14-cv-02551-JZ) filed November 19, 2014, in the United States District Court Northern District of Ohio Western Division, requires the City of Lima to implement a Supplemental Environmental Project (SEP) to provide for the revitalization of the Ottawa River banks in Lima, Ohio. To implement the SEP and improve water quality and habitat along the study site (Ottawa River corridor), a riparian restoration plan was developed and implemented. The restoration focuses on ecological sustainability while adhering to the requirements SEP set forth in the Consent Decree so that the City can meet the requirement that "Lima shall maintain the plantings in good conditions through the life of the Consent Decree" (December 31, 2043).

Geosyntec Consultants and Bassett and Associates collaborated with the City to create a sustainable restoration design for the Ottawa River corridor: an open woodland resembling an oak savanna. With EPA's approval, the Consent Decree schedule was adjusted from November 30, 2015 to June 30, 2016 to allow for tree planting in the spring of 2016. The City also furthered ecological stewardship of the area with established short-term and long-term maintenance plans. The selected restoration contractor, Davey Resource Group (Davey), is providing maintenance for a three-year period to provide control of invasive species and allow for native species to establish. Long-term maintenance will include mowing and prescribed ecological burns.

2. Detailed Description of SEP

The tasks outlined in the SEP included four items: ECOSystem Evaluation, Removing Large Trees, Clearing and Grubbing, and Planting. The schedule for tree planting was extended to Spring 2016 with EPA approval, for the benefit of oak species. The tasks were completed by the dates required under the Consent Decree: i.e. the ECOSystem Evaluation was completed by February 1, 2015, the removal of large trees by March 31, 2015, and clearing and grubbing tasks by August 30, 2015. As described below, continued monitoring of the SEP areas was conducted and follow up clearing or removals was performed as appropriate.

2-1. Designated Areas

Twenty (20) designated areas were delineated in the Consent Decree. The map of areas from the Consent Decree is attached in Appendix A. The SEP, as outlined in the Consent Decree, consisted of 6.6 acres of land along the Ottawa River, including 3,000 linear feet of stream bank on the north side of the river and 6,200 linear feet of stream bank on the south side of the river.

The designated areas were expanded during the restoration to include an additional stretch of river bank on the north side of the river, which spanned 815 feet. More upland area was included, which increased the size of the area to 10.4 acres.

2-2. ECOSystem Evaluation

The ECOSystem Evaluation occurred in the fall and winter of 2014 and was conducted by Bassett and Associates (Bassett). Dead, dying, diseased, and compromised trees were identified and are shown in Appendix B, ECOSystem Evaluation Map. Areas 8, 12, and 15 are not shown on the ECOSystem Evaluation Map. Areas 8, 12, and 15 were previously landscaped areas consisting of turf grass; no trees requiring removal were identified in these areas.

The ECOSystem evaluation identified the most suitable restoration ecosystem and the undesirable species present. Undesirable tree species marked for removal included Chinese elm, black locust, honey locust, tree of heaven, and mulberry. Adventive (introduced but not fully naturalized) trees, including cottonwood and box elder, were also selected for removal. Green ash trees were removed in anticipation of the emerald ash borer.

This task was completed on December 29, 2014, prior to deadline of February 1, 2015. Additionally, the restoration team has continually evaluated the plant life during the removal and treatment processes. After the large trees were removed in the spring of 2015, another evaluation was conducted in the summer of 2015. This evaluation identified some additional tree and shrubs which needed to be removed and also aggressive resprouts of invasive shrubs.

2-3. Removal of Trees

The dead, dying, diseased, and compromised trees identified in the ECOSystem Evaluation were removed by First Choice Tree by March 31, 2015. Fifty-three trees (greater than 12" in diameter) were removed, in addition to numerous small trees and shrubs. Treatment of invasive shrubs began in the fall of 2015, and additional removal of trees was conducted after September 30, 2015 and completed in the fall of 2015.

TAWA Tree Service conducted additional clearing and grubbing starting on April 20, 2015 and completed work on August 3, 2015. An additional ECOSystems evaluation was conducted July 7 through August 10, 2015, which identified woody resprout regrowth and additional trees desired for removal. Davey mobilized on November 2, 2015 and began treating invasive species on November 3, 2015. All undesirable trees were removed from the site on February 13, 2016.

2-4. Clearing and Grubbing

Clearing and grubbing was complete prior to August 30, 2015. Invasive species removed primarily consisted of woody shrub species, such as honeysuckle and glossy buckthorn. Invasive herbaceous species, such as reed canary grass, Japanese knotweed, and garlic mustard, were also removed.

Adventive and invasive species led to resprouts and regrowth, so follow-up clearing and grubbing was conducted in the fall to prepare for seeding of native grasses/wildflowers and planting of trees. All stumps were treated with a 20% solution of Garlon 4 in mineral oil

immediately following shrub removal. Foliar spraying was utilized to control invasive herbaceous growth.

The restoration team also removed invasive herbaceous species and woody resprouts in the spring of 2016. Three additional invasive species treatments are planned for the summer of 2016, and will continue as needed until 2018.

2-5. Planting

Planting for the Ottawa River riparian zone consisted of the tree stratum and three kinds of herb strata, as outlined below:

- Trees: 213 trees, primarily of oaks, were planted in the spring of 2016. Davey Resource Group provided and installed the trees. The tree planting plan is attached in Appendix C. Because oaks and hickories are most viable if planted in the spring, all trees were planted in early spring. Tree planting was completed the week of February 15, 2016. Planted tree species included:
 - *Cercis Canadensis* (CC) - Eastern redbud
 - *Platanus occidentalis* (PO) - Sycamore
 - *Quercus alba* (QA) - White oak
 - *Quercus bicolor* (QB) - Swamp white oak
 - *Quercus ellipsoidalis* (QE) - Northern pin oak
 - *Quercus macrocarpa* (QM) - Bur oak
 - *Quercus rubus* (QR) - Red oak

Trees not only have aesthetic value to the local community, but help maintain the riparian ecosystem through water quality protection, soil stabilization, groundwater recharge, river shading, and aquatic habitat. The selected tree species, primarily oaks, are tolerant of and thrive in fire regimes. Oak trees, recommended in the planting plan, are nearly always dug in the spring time, and planted shortly after for survivability.

- Oak savanna seed mix: 6.6 acres of oak savanna seed mix was seeded in the spring of 2016. Spence Nursery provided all seed mixes used for restoration. A map of seed mix areas is included in Appendix D. The majority of oak savanna seed mix was manually broadcasted due to the slopes of the river banks. The woodland savanna seed mix is included in Appendix E.
- Prairie seed mix: 2.3 acres of prairie mix was seeded in the spring of 2016. Prairie seed was typically sown using a seed drill, unless slopes prevented that method. Where a seed drill could not be used, a disc harrow was used to rough up the seeding area. Seed was manually broadcasted in these areas and raked into achieve sufficient seed-soil contact. Seeding was completed February 22, 2016. The prairie seed mix is included in Appendix F.

- **Cover crop mix:** The above herbaceous seed mixes were supplemented with cover crop seed. A cover crop seed mix was utilized to help keep out invasive and adventive species while the native oak savanna and prairie seed mixes become established.

Planting was supported with the use of topsoil provided by the City. Planting was completed in the spring of 2016 and the City has committed to a long-term maintenance plan. Davey is responsible for the success of the restoration until October 31, 2018 at the earliest; once Davey achieves the contracted performance criteria, the City will continue to care for the restored areas through the life of the SEP. If possible, the City will utilize controlled ecological burns to maintain native species. The City of Lima Parks Department has been actively involved in the SEP restoration process and has started to budget for the cost of controlled burning for 2019.

Davey's performance criteria include a full and established native understory, 213 "thriving" trees, and a minimal presence of invasive species.

2-6. Tasks and Schedule

The tasks and schedule outlined by the Consent Decree (as modified) were followed during the SEP implementation. The modifications and recommended timeline were submitted as attachments to a Consent Decree Modification requested by the City on June 5, 2015 (Appendix G). USEPA agreed to the Consent Decree Modification on July 20, 2015 (Appendix H).

The sub-tasks, schedule, and cost of the City's restoration plan are summarized in Table 1 below.

Table 1: Sub-tasks, Schedule, and Costs of the City's Restoration Plan

Task	Schedule	Completion Date	Cost
ECOSystem Evaluation	Winter 2014	12/29/2014	\$7,306
Tree Removal	Winter 2015	2/20/2015	\$111,398
Clearing and Grubbing	Winter 2015	2/20/2015	\$71,734
Removal of Invasive Species	Through 12/31/2043	12/31/2043	\$54,635
Tree Planting	Spring 2016	2/19/2016	\$83,253
Seed Bed Prep	Fall 2015- Spring 2016	2/19/2016	\$25,438
Seeding	Fall 2015- Spring 2016	2/22/2016	\$25,438
Monitoring and Management	Through 10/31/2018	10/31/2018	\$114,682
Long-term Management	Through 12/31/2043	12/31/2043	TBD

Consultant management costs are not shown in Table 1 above but are included in Section 4.

3. Problems Encountered

The restoration team outlined the most sustainable approach for restoration (see Appendix G), which included short-term and long-term maintenance plans, and also identified the preferable timing to plant oak trees. According to restoration professionals, oak trees have the greatest survivability if planted in the spring. A non-material consent decree modification was obtained to extend the completion date of the SEP from November 30, 2015 to June 30, 2016 to accommodate a spring tree planting. The spring planting and maintenance plans, including invasive species control, mowing, and prescribed burning, placed the installation of the SEP in line with sustainable restoration, with the goal of a restored ecosystem throughout the life of the Consent Decree (28 years).

The SEP, as prescribed in the Consent Decree, did not include a maintenance plan. Restoration industry standards require at least 3 to 5 years to establish a restored ecosystem. After the ecosystem is established, it must be maintained through the use of controlled burning or mowing. The City acquired Davey's services for at least 3 years (through October 31, 2018). Davey is required to achieve a controlled burn prior to leaving the site, at which point the City will be responsible for maintenance. The City is starting to budget for the cost of controlled burns. Geosyntec will provide a long-term maintenance plan.

The SEP required 6.6 acres of restoration. The restoration plan developed by Geosyntec Consultants and Bassett and Associates included 10.6 acres of land, which specified a six-foot buffer along the river walk. The SEP did not include restoring the area between the river bank and the river walk. An additional pocket of invasive species was also identified. These areas were added to the restoration plan to help result in an overall plan that would be more conducive to long-term management.

After herbicide was applied to kill the turf grass in preparation for restoration to native prairie, it was noted by the City Parks representatives that additional buffer would be needed for the river walk to provide access for community recreational activities (organized runs, biking events, etc.). The buffer was increased along 2,500 linear feet between College Street and Main Street on the south side of the river, increasing the overall size of the buffer by approximately two-tenths of an acre in area. This includes an additional 3 feet of buffer and arcs around park benches. This had slight impacts on SEP areas 5, 6, 8a, 8b, 12a, 13, 17, and 19. Davey reseeded the damaged buffer area with new grass species.

After the first pass of tree removal and clearing and grubbing, dense areas of the site previously inaccessible were evaluated for the presence of undesirable species. Select trees in the additional area added to the restoration (see Appendix D) and in the previously inaccessible areas were marked for removal. The trees were removed in the fall and winter of 2015.

After planting, it was observed that the trees did not survive the planting. It is Davey Resource Group's assessment that environmental conditions (in other words wide fluctuations in temperature along with a possible late frost, followed by two periods of warm dry weather) may

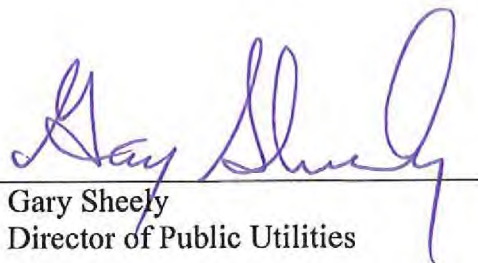
have contributed to the mortality of the already sensitive newly planted trees. Davey is responsible for replanting all damaged and dead trees to fulfill their contracted responsibility to provide 213 surviving and "thriving" trees. Some oak species will need to be replanted in the spring of 2017. Davey is also continuing to remove invasive resprouts and create conditions that will allow the native prairie to be established. Appendix I includes an assessment of what is currently understood regarding the loss of the trees and a corrective action plan. Geosyntec is continuing to assist the City to make sure that the corrective action plan is implemented successfully.

4. SEP Costs

The City of Lima has expended \$494,122 to implement the SEP as of June 20, 2016. Additional costs to retain Davey and consultants (Geosyntec and Bassett) through October 31, 2018 is expected to total \$153,670. The total cost to implement the SEP to October 31, 2018 is estimated at \$647,791.

5. Certification

I certify under penalty of law that the information contained in or accompanying this submission/document) is true, accurate and complete. As to (the/those) identified portion(s) of this (submission/document) for which I cannot personally verify (its/their) truth and accuracy, I certify as the official having supervisory responsibility for the person(s) who, acting under my direct instructions, made the verification, that this is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.



Gary Sheely
Director of Public Utilities

6. Environmental and Public Health Benefits

An i-Tree Hydro Analysis was completed in 2016 to quantify benefits resulting from the Ottawa River restoration. i-Tree Hydro (i-Tree) is a program developed by USDA Forest Service (2014) to simulate the effects of tree cover on runoff and water quality. i-Tree was utilized to estimate the benefits of planting 213 trees as part of the SEP. Three alternative conditions were examined with i-Tree:

- **Baseline:** The baseline condition represents the pre-restoration conditions. Additional conditions are compared to the baseline to quantify improvement.

- **Newly Planted:** The newly planted condition represents the expected benefits from the SEP in the first year after planting. The trees and herbaceous native plants were planted in late 2015 and early 2016. Trees will be replanted in 2016 and Spring of 2017.
- **Full Canopy:** The full canopy condition represents the expected benefits per year when the trees reach full canopy. For purposes of the calculation, a tree at full canopy was assumed to have an average stem diameter of two feet.

Percent cover was the primary differentiator in analysis. The percent cover values for the three alternative conditions are shown in Table 2 below. Percent cover values in i-Tree represent relative percent cover (i.e. values add up to 100%).

Table 2: Percent Cover

Cover	Baseline	Recently Planted	Full Canopy
Tree	48.2%	74.2%	97%
Shrub	30%	5%	0%
Herbaceous	15.8%	14.8%	0%
Water	5%	5%	2%
Impervious	1 %	1%	1%
Bare Soil	0%	0%	0%

Baseline percent cover values were based on aerial imagery and knowledge of past site conditions. Recently planted cover values were based on knowledge of current site conditions and calculations for existing average canopy area. Similarly, full canopy cover values were based on calculations for projected canopy areas for fully mature trees.

Other input parameters included in the i-Tree analysis are summarized in Table 3 below.

Table 3: Input Parameters for i-Tree Analysis

Input Parameter	Source
Precipitation	Weather Station Lima Allen CO 724298-04850
Flow	USGS 04187100 Ottawa River at Lima, OH
Topographic Index (TI)	Provided by i-Tree for Lima, OH
Soil Type	Web Soil Survey at Ottawa River
Area	GPS survey provided by Davey
Crown Area	Hemery et al.

The results of the i-Tree analysis are summarized in Table 4 below. Results are shown relative to the baseline (pre-restoration) condition described above.

Table 4: Results of i-Tree analysis

Parameter compared to Baseline	Recently Planted Reduction (pounds/year)	Full Canopy Reduction (pounds/year)
Runoff	2%	26%
Total Suspended Solids (TSS)	5,480	14,550
Chemical Oxygen Demand (COD)	3,700	9,800
Total Kjeldahl Nitrogen (TKN)	120	320
Total Phosphorus (TP)	20	60

As shown in Table 4 above, planting 213 trees as part of restoration has a quantitative benefit on water quality, especially with time. With the restoration, runoff is expected to decrease, along with associated pollutants.

Although not provided in the i-Tree analysis, further restoration benefits relating to channel shading and streambank stabilization are also expected. The additional trees planted as part of the SEP constitute a public good that has the potential to benefit residents of Lima for years to come (Wolf, 2007). Public health and well-being can be expected to increase as the River Walk continues to be enhanced. Trees provide improved air quality, and the clearing of invasive shrub species allows residents to enjoy the river recreationally, leading to improved mental health and increased use of the river walk for exercise activities, such as the upcoming 15th Annual Freedom 5K Run/Walk, held on July 4, 2016, or the Kewpee Triathlon/Duathlon on July 31, 2016, both of which will utilize the Ottawa River Walk as a portion of the course (www.ohiorunner.com accessed 6/20/2016).

Urban parks similar to what is being created in Lima, in part due to this SEP, can provide significant air quality benefits in urban areas. Trees can reduce urban heat islands and contribute to cooling effects in local neighborhoods increasing human comfort and reducing energy use and associated costs. The cooling effects provided by the tree canopy could lead to ancillary benefits such as reducing air pollution and reductions in ultraviolet radiation and carbon dioxide (Nowak and Heisler, 2010).

7. Conclusion

Davey's restoration work will continue to October 31, 2018, a three-year restoration industry standard that will allow for intensive care of the area, including re-seeding, replanting, and continual invasive species control as necessary to establish a healthy, native ecosystem to be retained for the life of the SEP. A long-term management plan also will be developed to guide the City's efforts to maintain the restoration.

Once native vegetation is fully established, the restoration area is intended to be maintained in the long-term using a regular schedule of prescribed fire. The resultant landscape will resemble an oak savanna, with mixed tree species that are tolerant of, and thrive in, prescribed burn regimes. The long-term use of prescribed fire also is an essential component to minimizing the return of invasive brush and weeds and maintaining a healthy understory of native grasses and forbs.

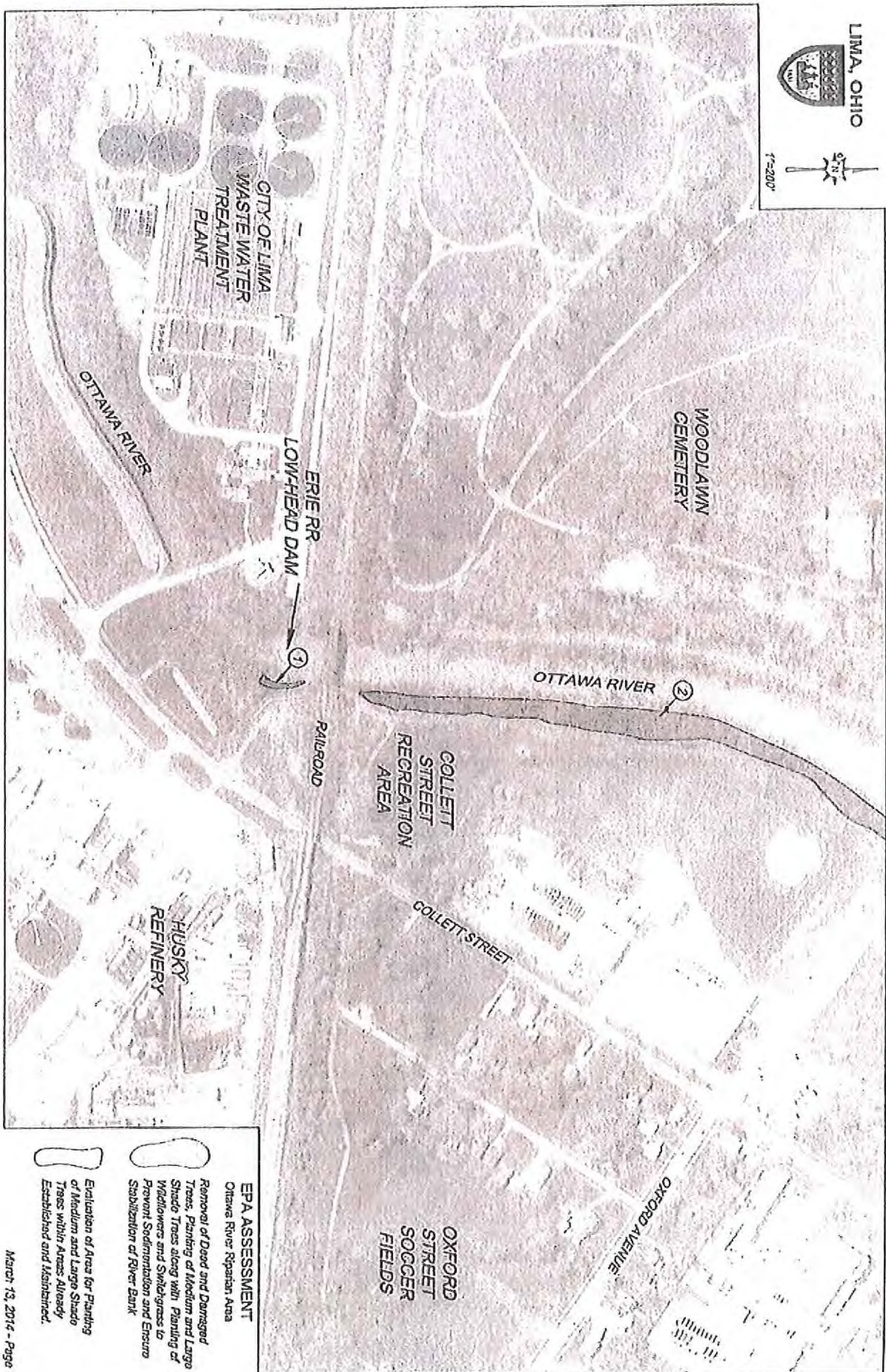
8. References

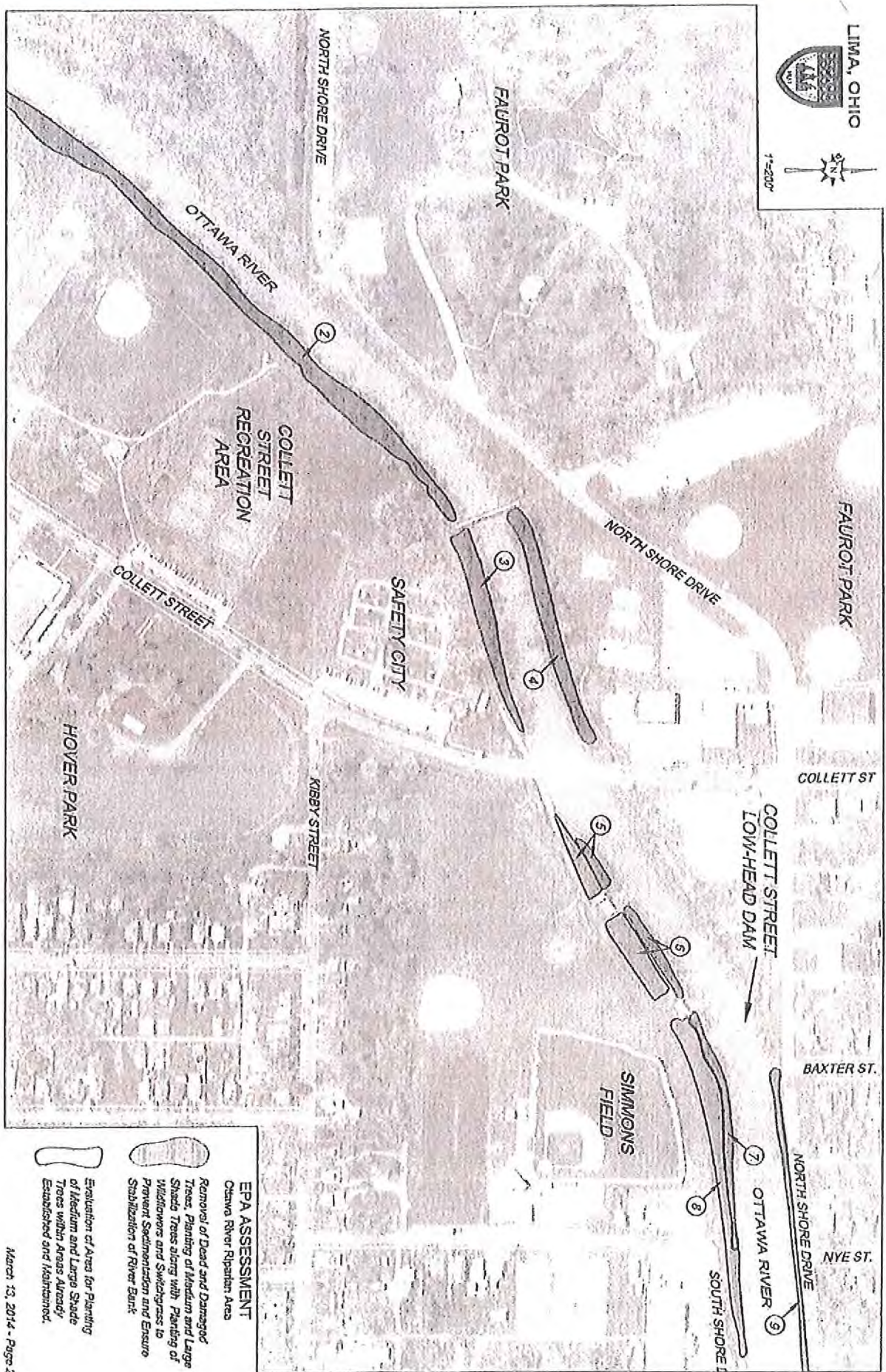
Hemery, G.E., Savill, P. & Pryor, S.N. (2005). Applications of the crown diameter – stem diameter relationship for different species of broadleaved trees. *Forest Ecology and Management* 215, 285-294

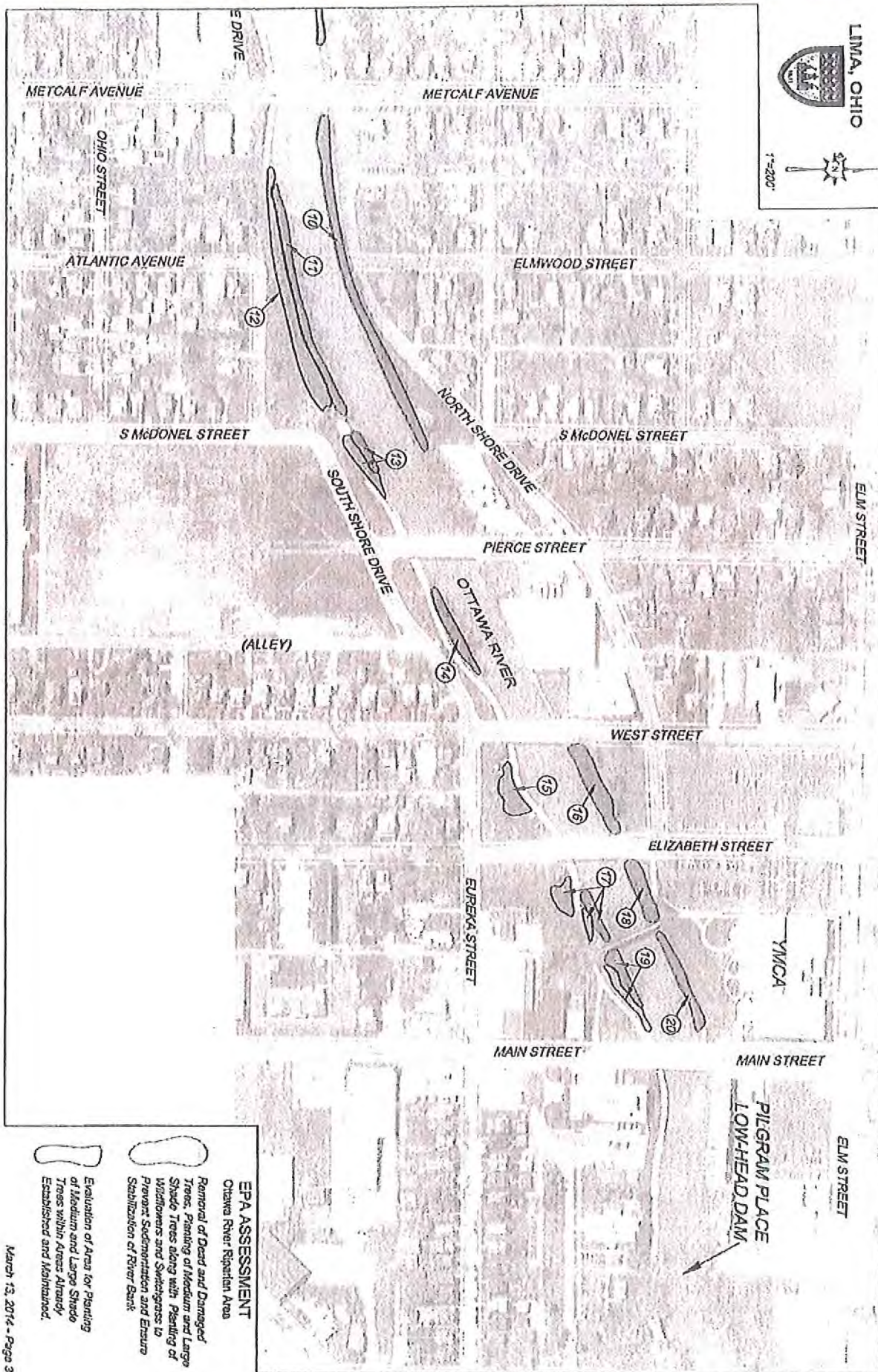
Novak, David J., and Gordon M. Heisler. "Air Quality Effects of Urban Trees and Parks: Executive Summary." Ashburn, VA: National Recreation and Park Association, 2010, www.nrpa.org/uploadedFiles/nrpa.org/Publications_and_Research/Research/Papers/Nowak-Heisler-Summary.pdf.

USDA Forest Service (2014). i-Tree Hydro v. 5.0. www.itreetools.org/hydro/index.php

Wolf, Kathleen L. "City Trees and Property Values." *Arborist News* 16, no. 4, 2007, www.naturewithin.info/Policy/Hedonics_Citations.pdf.







PART 1 LARGE TREE REMOVAL INVENTORY

REMOVE TREE	REVIEW/REMOVAL W/ CITY	PROTECT
SIZE 12" - 24"	20 (NONE)	(2) PAWPAW TREE
SIZE 25" - 36"	0	(2) BALD CYPRESS TREE
SIZE 37" - 60"	0	GROUP OF STAGHORN SUMAC
SIZE 61" - OVER	0	

PART 1 CLEARING AND GRUBBING INVENTORY

REMOVE TREE	SIZE 6" - 10"
6	

OTHER

BOXELDER CUT TWO 8" BRANCHES AND LEAVE TRUNK

REMOVE - 8" BOXELDER
(CLEARING AND GRUBBING BID)
REMOVE - 12" ELM
REMOVE - 12" ELM

PROTECT - BALD CYPRESS

BOX ELDER - CUT TWO 8" SIDE BRANCHES
HANGING ON THE WIRES AND LEAVE TRUNK

REMOVE - 24" AND 18" SPLIT MULBERRY
MULTI-TRUNK
PAWPAW

PROTECT - BALD CYPRESS

REMOVE - 12" DEAD ELM

REMOVE - DOUBLE 12" AND 8" DEAD ELM

REMOVE - 10" BOXELDER
(CLEARING AND GRUBBING BID)

REMOVE - 12" BOXELDER

REMOVE - 12" DEAD ELM BROKEN OFF AT 20'

REMOVE - 18" DEAD ELM

REMOVE - 18" DEAD ELM

REMOVE - 12" TREE OF HEAVEN

REMOVE - 12" TREE OF HEAVEN

REMOVE - 12" TREE OF HEAVEN

REMOVE - 12" TREE OF HEAVEN

REMOVE - 12" TREE OF HEAVEN

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REMOVE - 12" TREE OF HEAVEN

REMOVE - 12" TREE OF HEAVEN

REMOVE - 12" TREE OF HEAVEN

- RECOMMEND MARKING DESIRABLE PLANTS AFTER REMOVAL OF LARGE TREES
- PART 1 HAS A CONSIDERABLE AMOUNT OF INVASIVE GRAPEVINE AND POISON HEMLOCK
- RECOMMEND CLEAR AND GRUBBING HONEY-SUCKLE ONLY, DO NOT DISTURB STEEPLY SLOPED BANKS
- RECOMMEND REMOVING TREE OF HEAVEN, BLACK LOCUST, AND MULBERRY UNDER STORY TREES ONLY

CONSENT DECREE AREA DESIGNATION:

- AREA (1-2)

0 100 200

12/22/14

14017

14017

14017

14017

14017

Major Tree Removal (12' Diameter & Larger) - Part 1

Ottawa River Riparian Area

Ottawa River
Lima OH

BASSETT ASSOCIATES

LANDSCAPE ARCHITECTS / PLANNERS

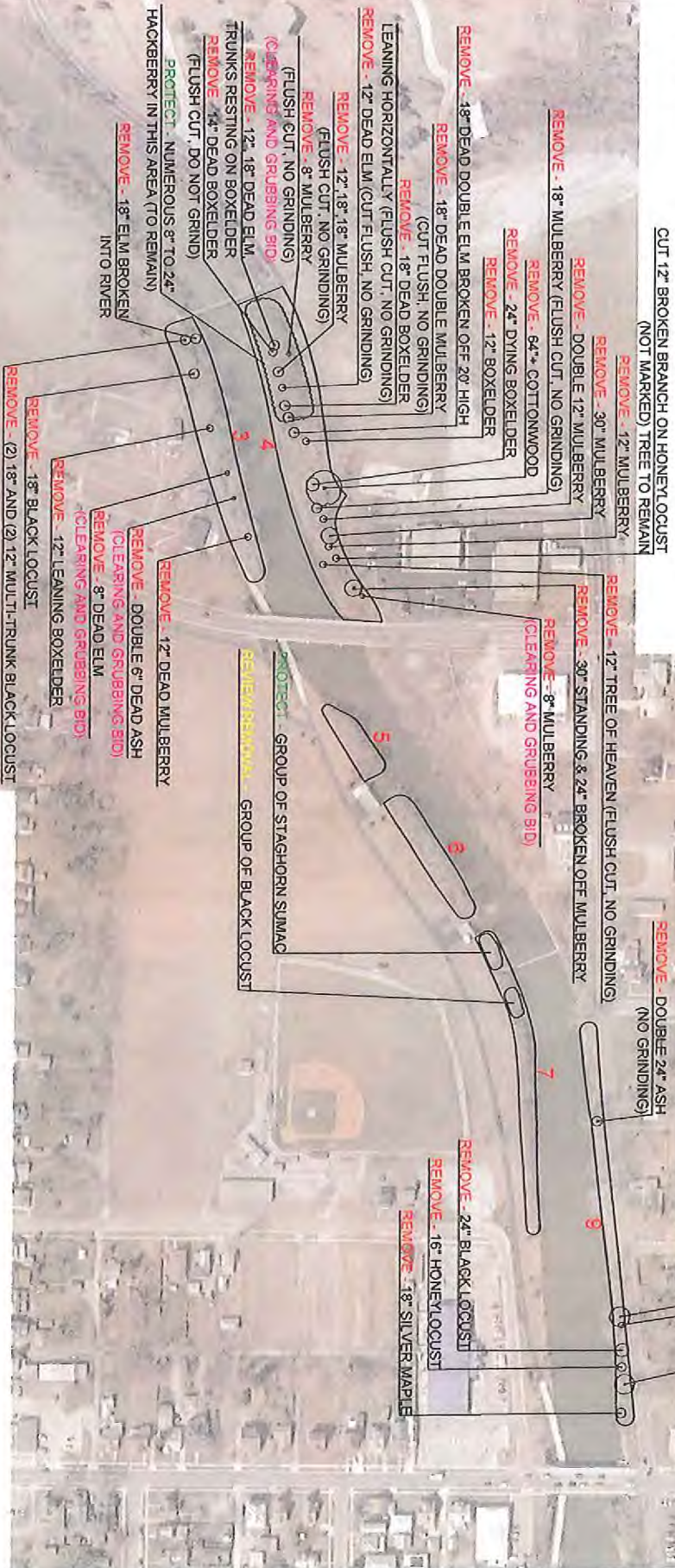
4101 Ash Rd. Lima, Ohio 43026 Ph: (614) 231-8181 Fax: (614) 231-8181

PART 2 LARGE TREE INVENTORY

REMOVE TREE	REVIEW REMOVAL W/ CITY	PROTECT	OTHER
SIZE 12" - 24"	23	DOUBLE TRUNK COTTONWOOD	GROUP OF STAGHORN SUMAC
SIZE 25" - 36"	3	GROUP OF BLACK LOCUST	HONEYLOCUST CUT 12" BRANCH AND LEAVE TRUNK
SIZE 37" - 60"	0		GROUP OF HACKBERRY
SIZE 61" - OVER	1		

PART 2 CLEARING AND GRUBBING INVENTORY

REMOVE TREE	5
SIZE 6" - 10"	



NOTES:

- RECOMMEND MARKING DESIRABLE PLANTS AFTER REMOVAL OF LARGE TREES
- RECOMMEND CLEAR AND GRUBBING HONEYSUCKLE ONLY. DO NOT DISTURB STEEPLY SLOPED BANKS
- RECOMMEND REMOVING TREE OF HEAVEN, BLACK LOCUST, AND MULBERRY UNDER STORY TREES ONLY

CONSENT DECREE AREA DESIGNATION:

-AREA (3-7, 9)

0 100 200

NORTH

DATE: 12/25/14

PROJECT NO: 14017

L2

Major Tree Removal (12' Diameter & Larger) - Part 2

Ottawa River Riparian Area

Ottawa River
Lima OH

BASSETT ASSOCIATES

LANDSCAPE ARCHITECTS / PLANNERS

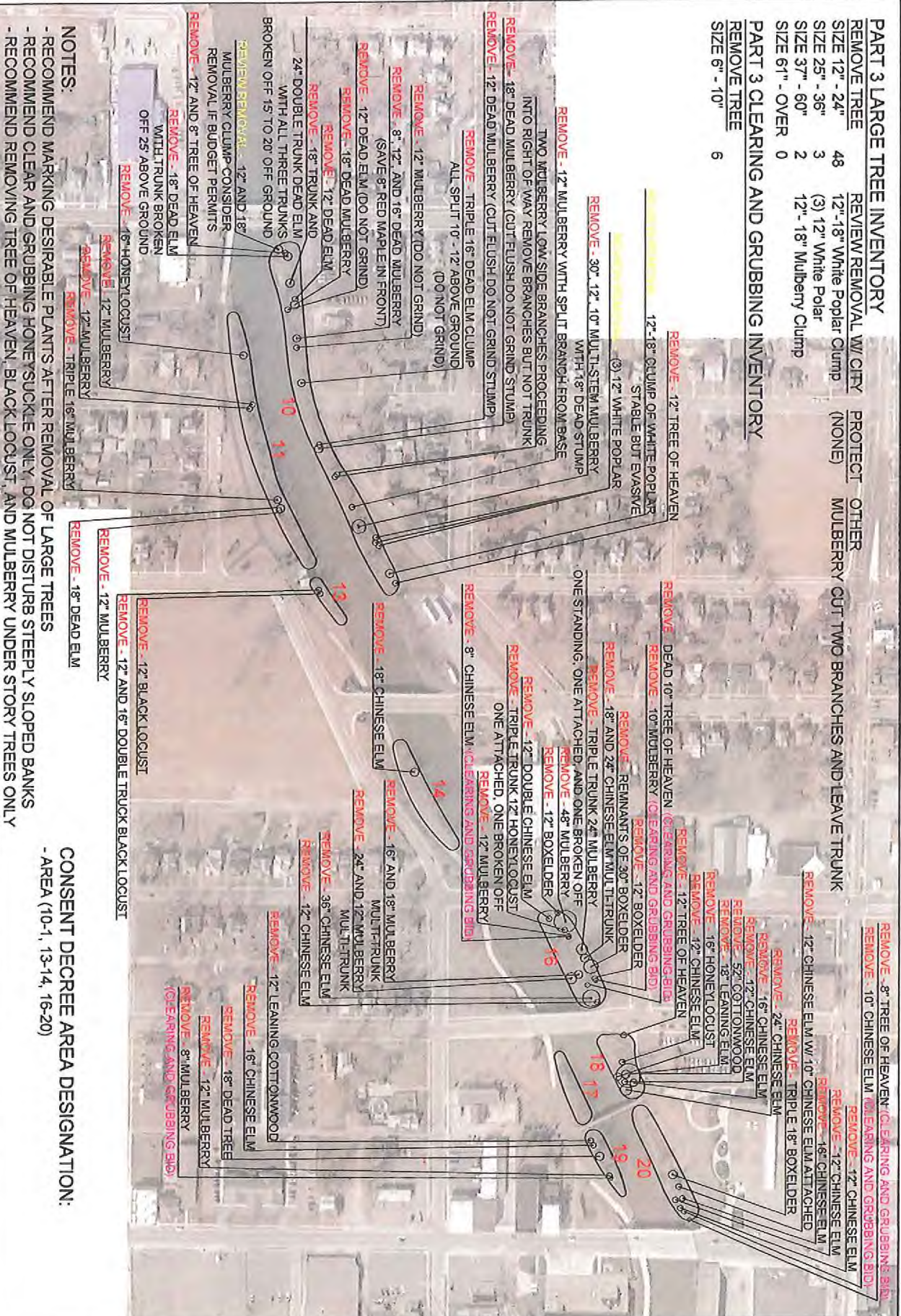
6150 Ash Rd Lima, Ohio 43150 Ph (419) 221-4151 Fax (419) 221-4438
info@bassettassociates.com www.bassettassociates.com

PART 3 LARGE TREE INVENTORY

REMOVE TREE	REVIEW REMOVAL W/ CITY	PROTECT	OTHER
SIZE 12" - 24"	48	12"-18" White Poplar Clump	(NONE)
SIZE 25" - 36"	3	(3) 12" White Poplar	
SIZE 37" - 60"	2	12" - 18" Mulberry Clump	
SIZE 61" - OVER	0		

PART 3 CLEARING AND GRUBBING INVENTORY

REMOVE TREE	SIZE 6" - 10"
	6



NOTES:

- RECOMMEND MARKING DESIRABLE PLANTS AFTER REMOVAL OF LARGE TREES
- RECOMMEND CLEAR AND GRUBBING HONEYSUCKLE ONLY, DO NOT DISTURB STEEPLY SLOPED BANKS
- RECOMMEND REMOVING TREE OF HEAVEN, BLACK LOCUST, AND MULBERRY UNDER STORY TREES ONLY

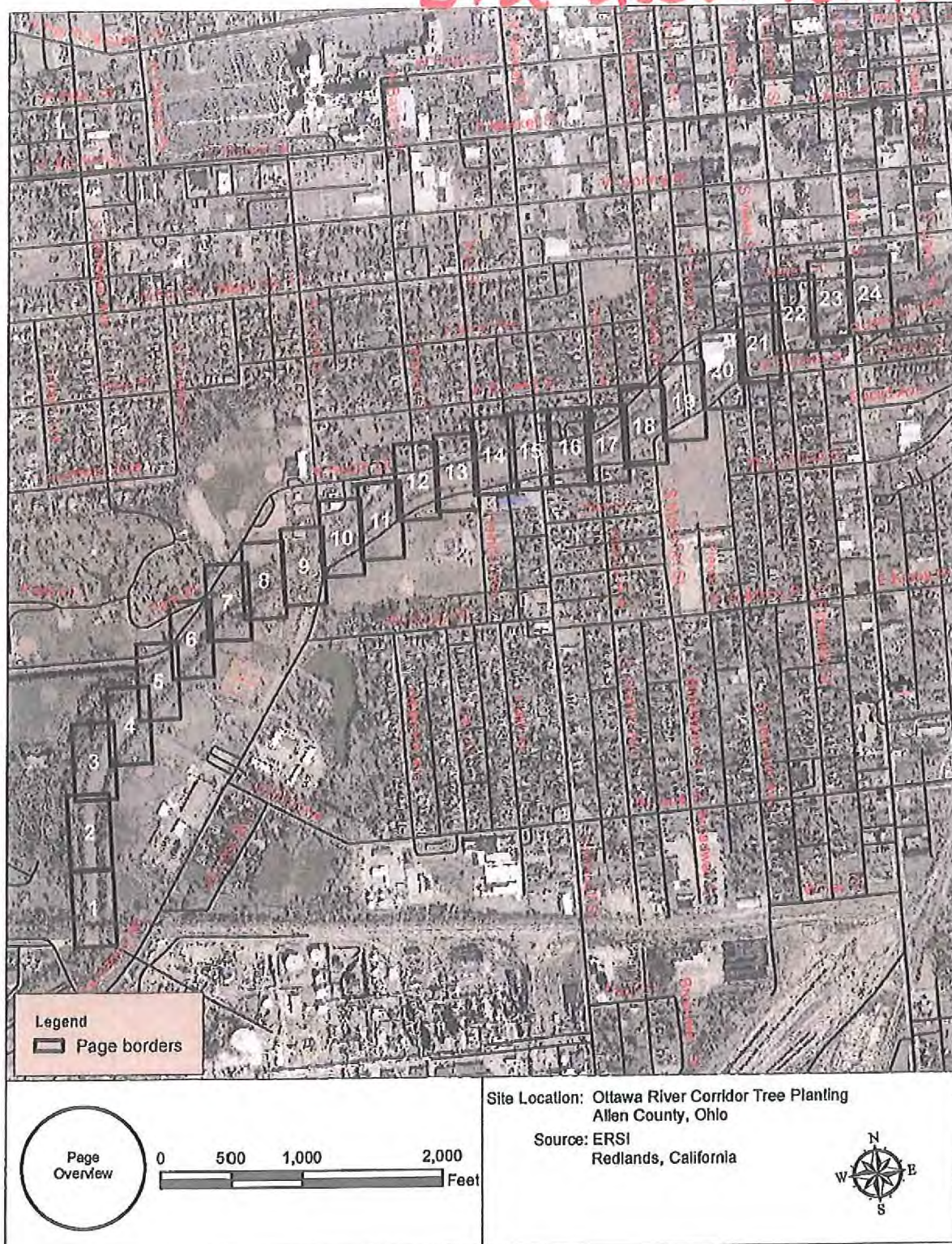
CONSENT DECREE AREA DESIGNATION:

- AREA (10-1, 13-14, 16-20)

Bassett Associates Revisions to Field Staking 2/4/16

Ottawa River Corridor
Tree Installation Maps

(Tree count to match
bid documents)



Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



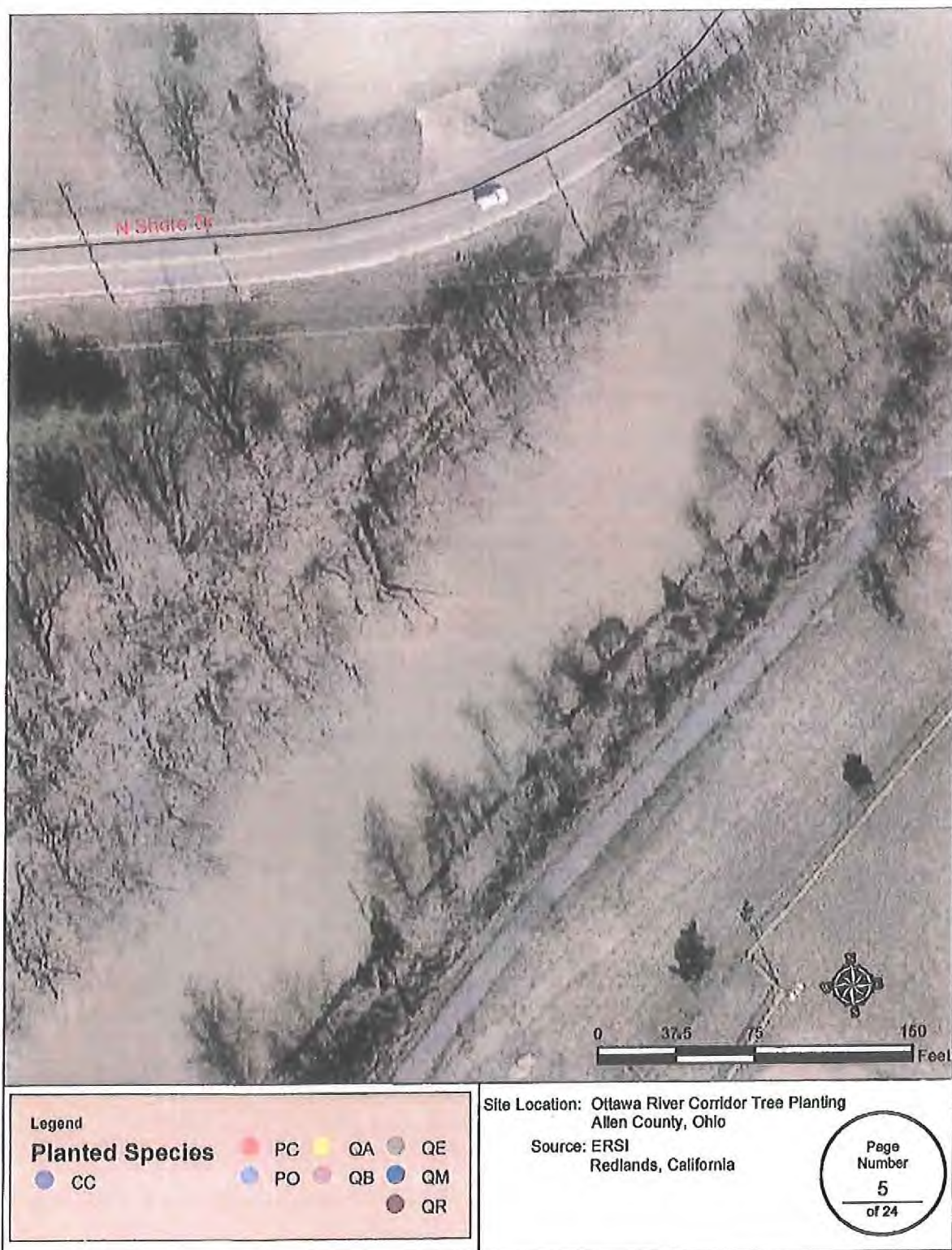
*Ottawa River Corridor
Tree Installation Maps*



Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps





Ottawa River Corridor Tree Installation Maps

QE



Legend

Planted Species

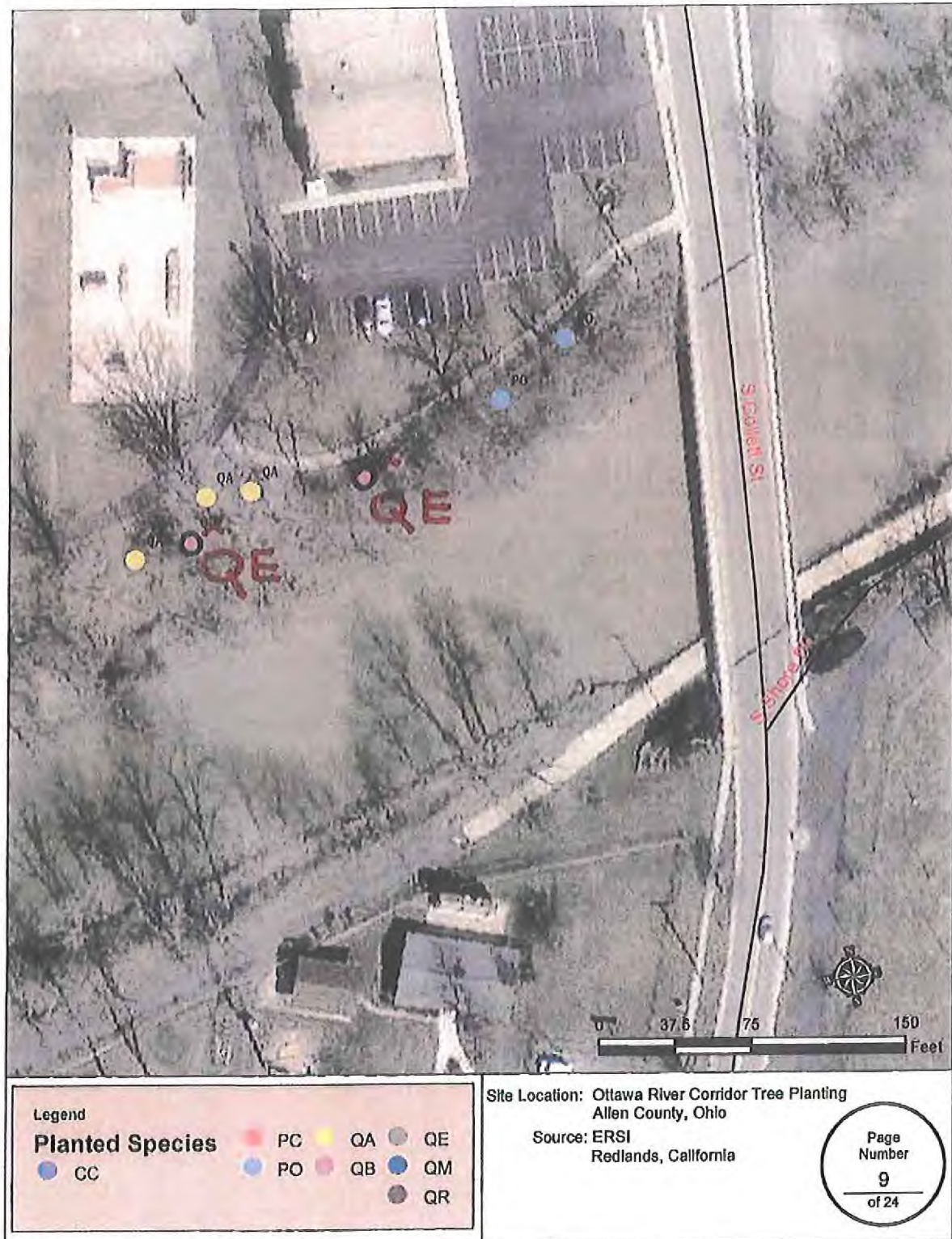
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|------|------|------|------|
| ● CC | ● PC | ● QA | ● QE |
| ● PO | ● QB | ● QM | ● QR |

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Allen County, Ohio

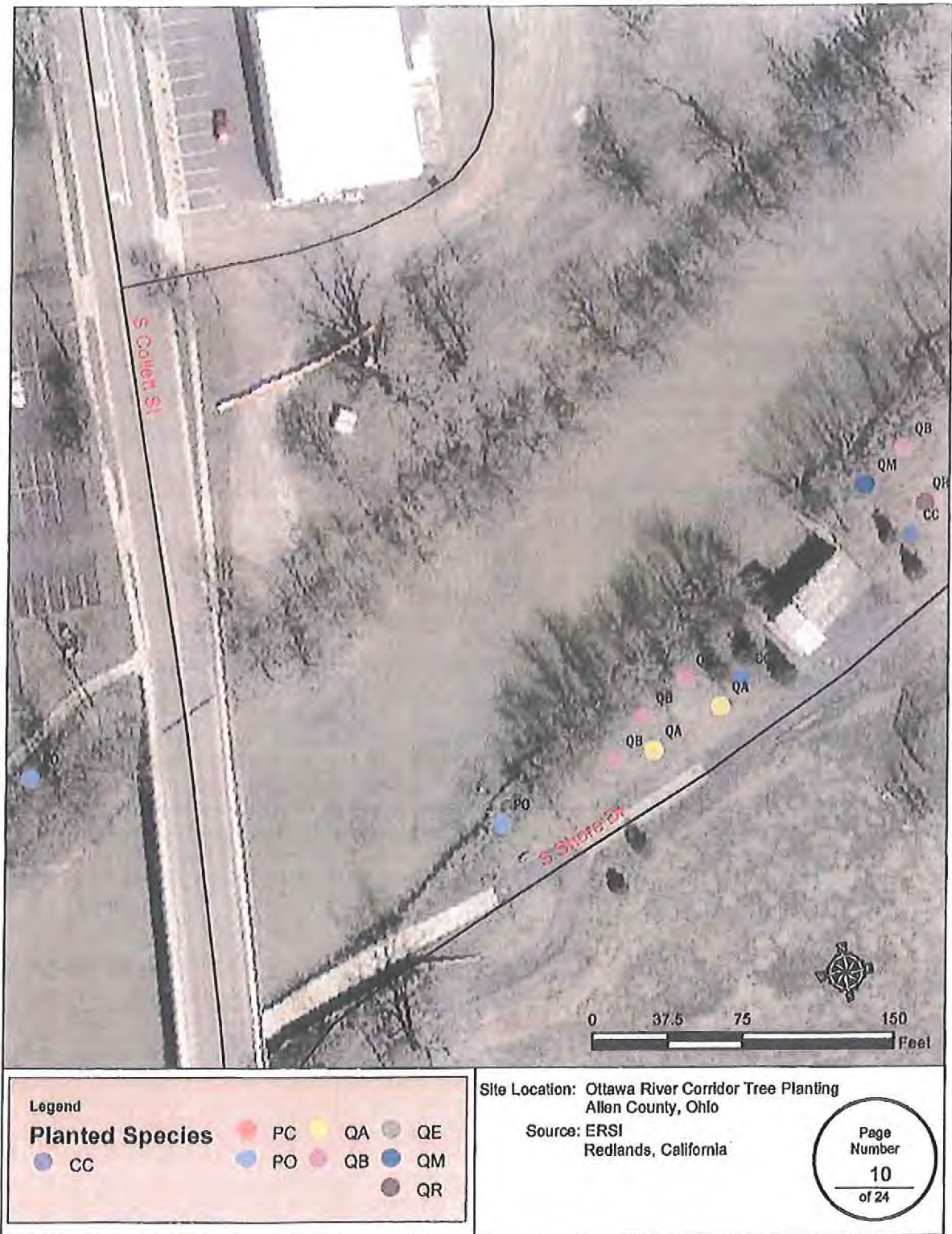
Source: ERSI
Redlands, California

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Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



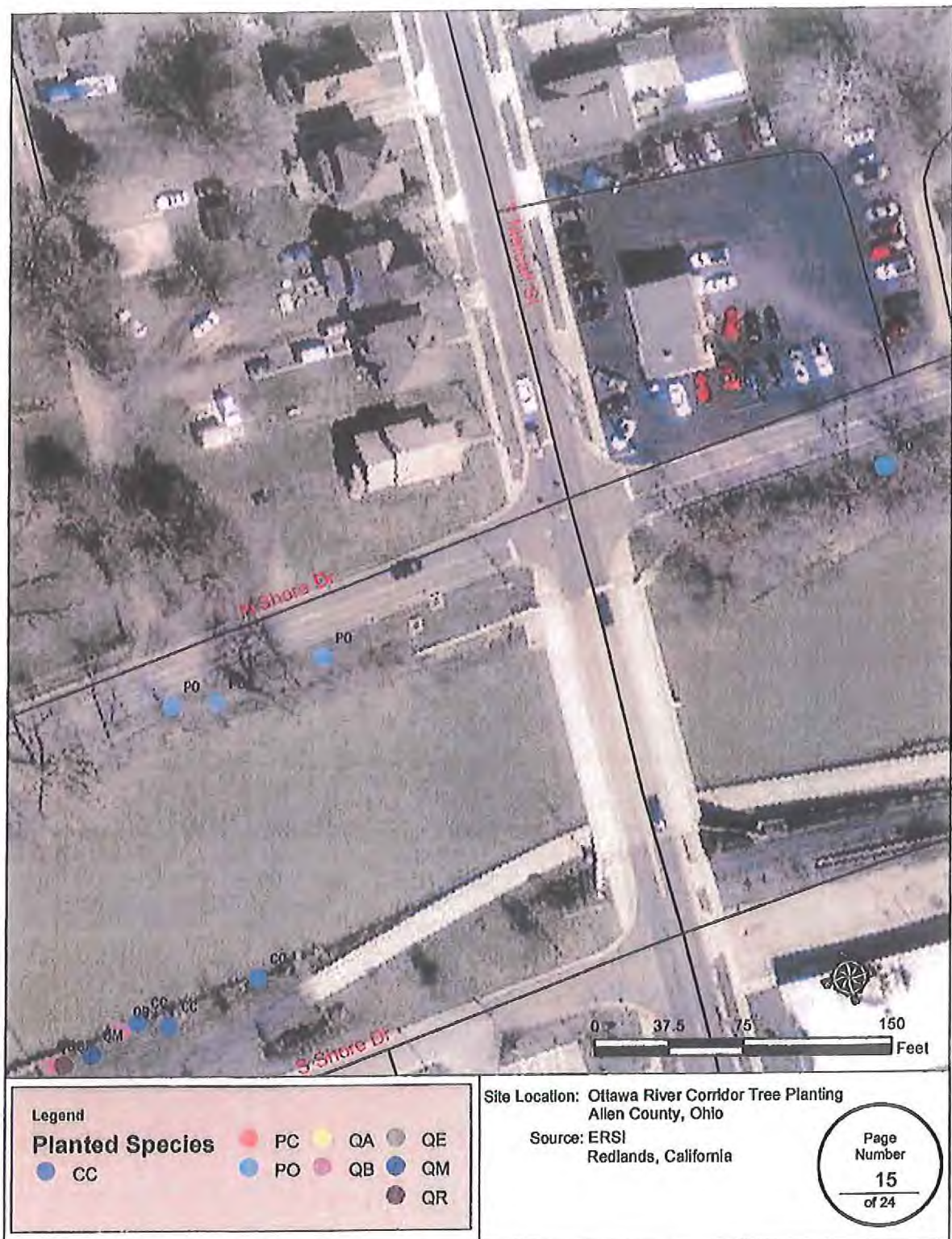
Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



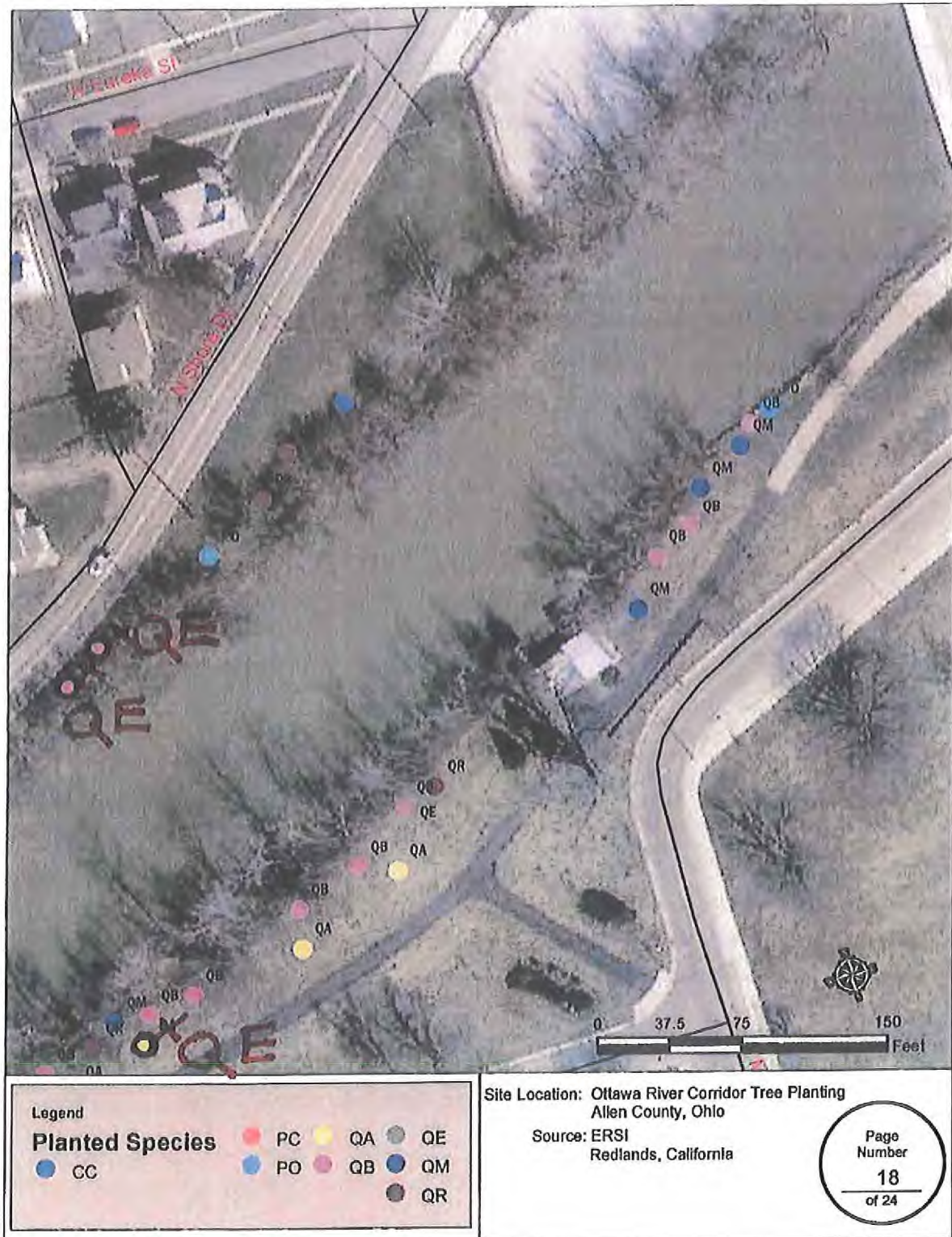
Legend Planted Species ● CC ● PC ● PO ● QA ● QB ● QE ● QM ● QR		Site Location: Ottawa River Corridor Tree Planting Allen County, Ohio Source: ERSI Redlands, California	Page Number 16 of 24
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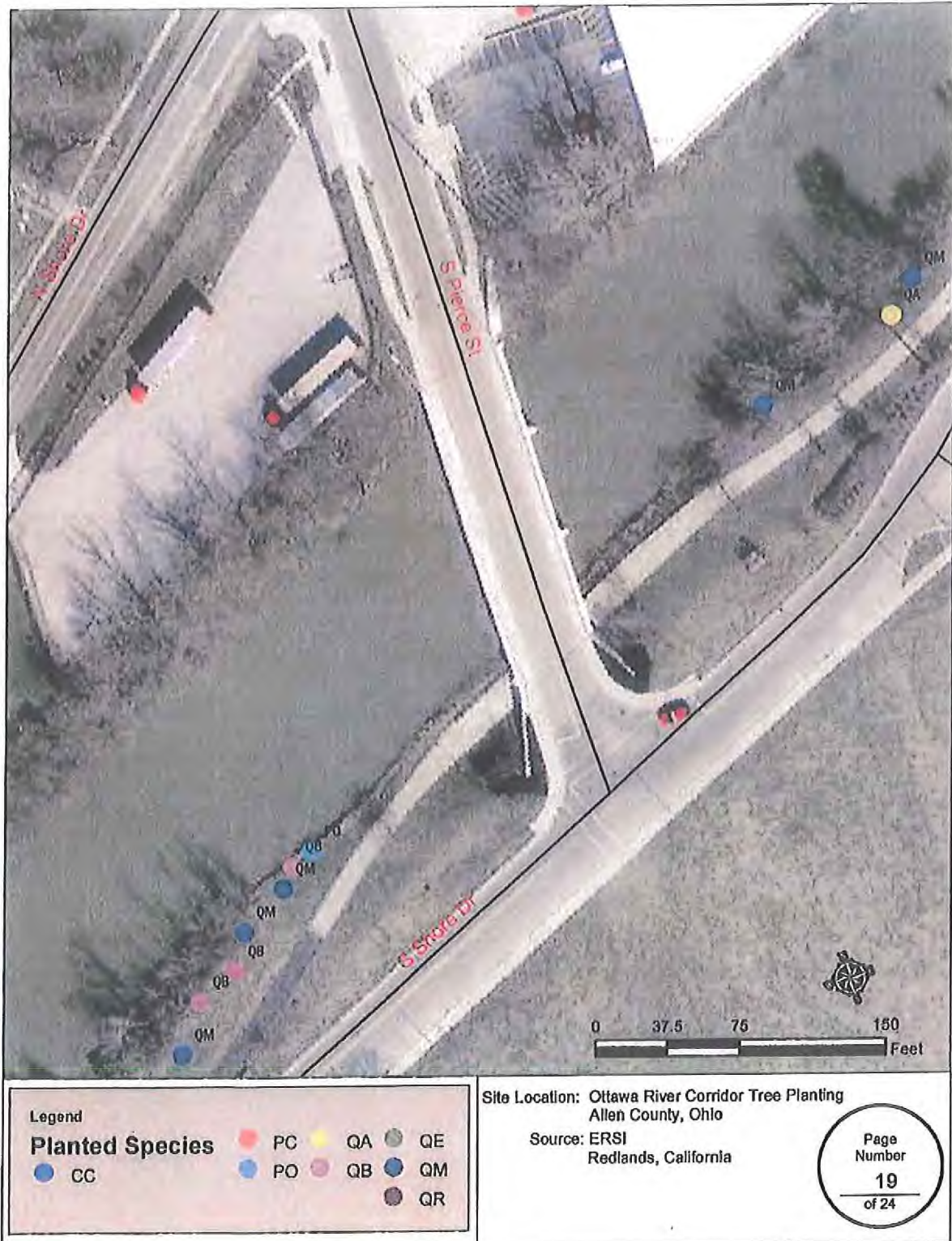
Ottawa River Corridor Tree Installation Maps



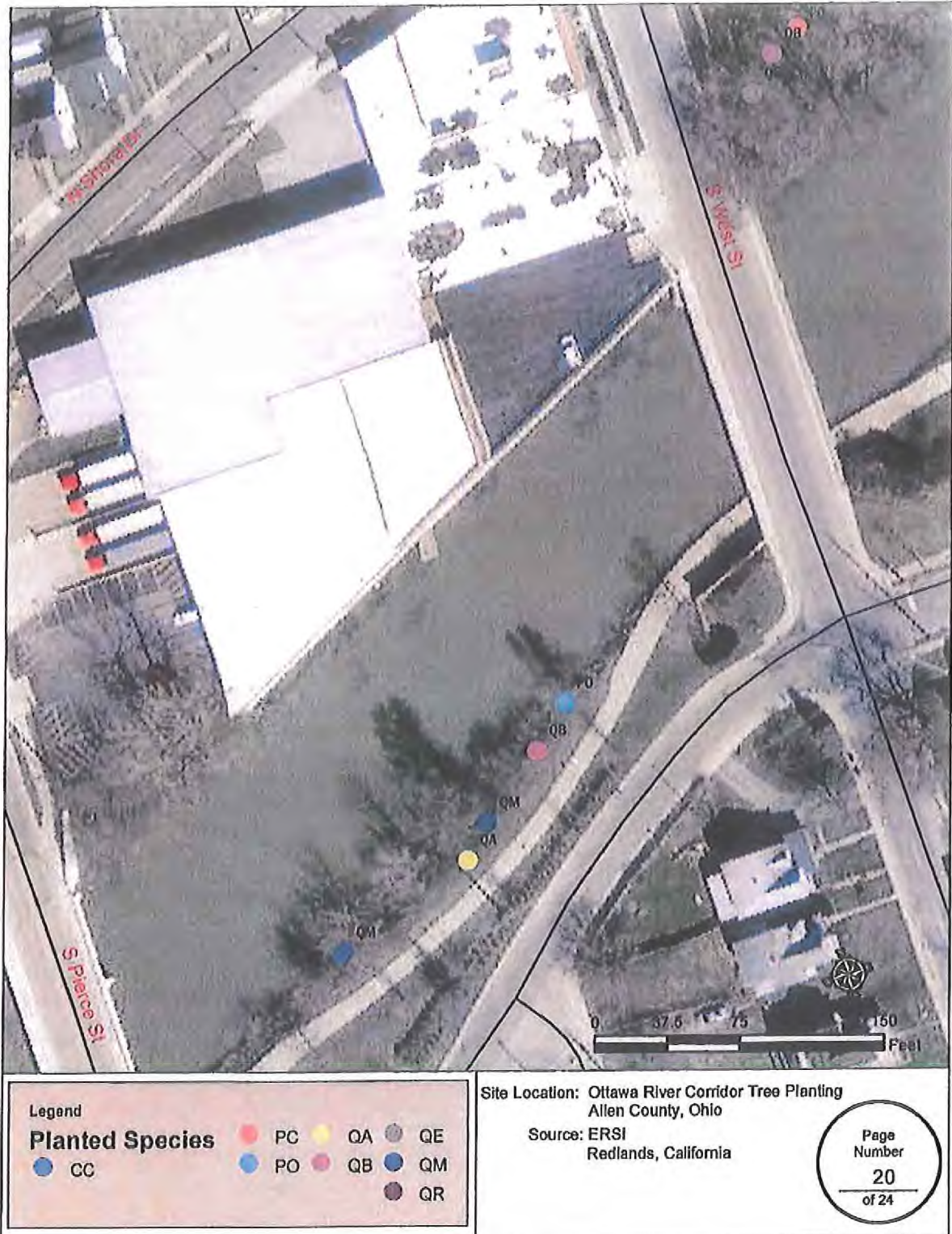
Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



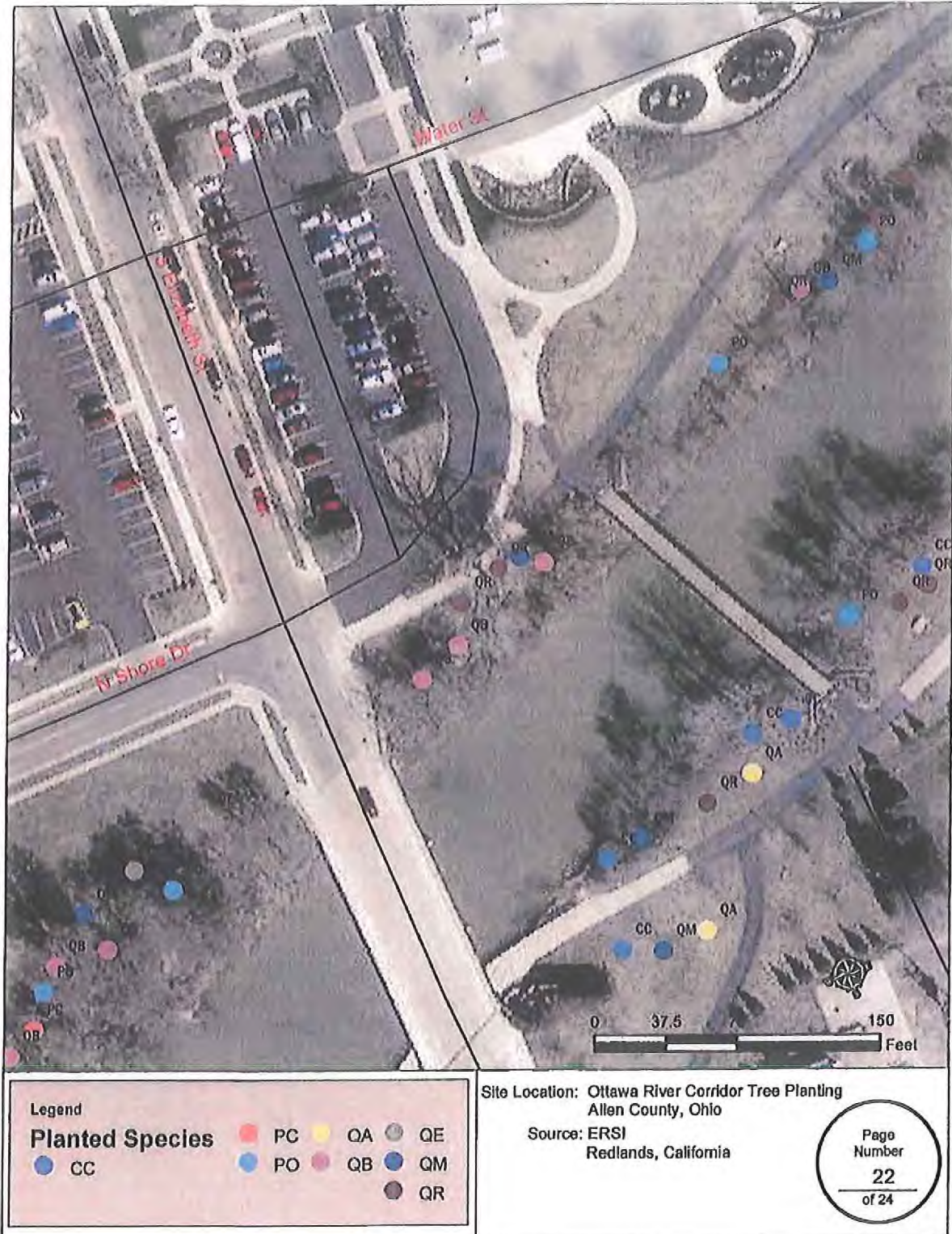
Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



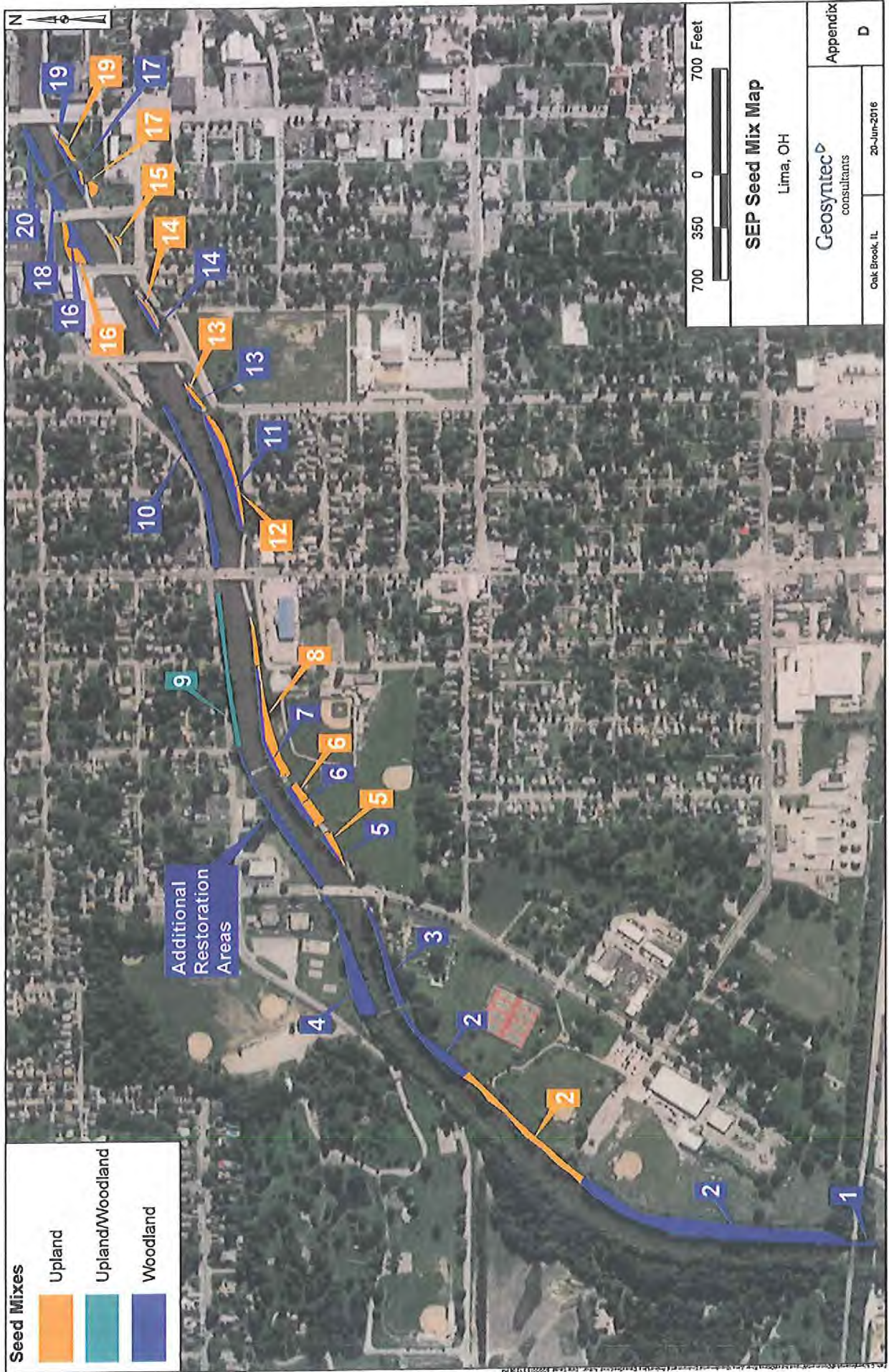
Ottawa River Corridor Tree Installation Maps



Ottawa River Corridor Tree Installation Maps



Legend Planted Species ● CC ● PC ● PO ● QA ● QB ● QE ● QM ● QR		Site Location: Ottawa River Corridor Tree Planting Allen County, Ohio Source: ERSI Redlands, California	Page Number 24 of 24
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SPENCE RESTORATION NURSERY

Woodland & Savanna Plants			6.5 ACRE(S)	
Davey Resource - Ottawa River Restoration				
Small Seed				
Species	PLS weight (oz)/acre	PLS weight (oz)/mix		
Carex normalis	1	6.50		
Carex cephalophora	0.25	1.63		
Carex sparganoides	1	6.50		
Diarrhena obovata	8	52.00		
Allium cernuum	2	13.00		
Anemone virginiana	0.5	3.25		
Aquilegia canadensis	1	6.50		
Arisaema triphyllum	1	6.50		
Aster cordifolius	2	13.00		
Aster shortii	2	13.00		
Blephilia hirsuta	2	13.00		
Campanula americana	1	6.50		
Dodecatheon meadia	0.25	1.63		
Eupatorium purpureum	1	6.50		
Geranium maculatum	1	6.50		
Heliopsis helianthoides	4	26.00		
Monarda fistulosa	0.5	3.25		
Penstemon digitalis	2	13.00		
Polygonatum pubescens	2	13.00		
Rudbeckia hirta	4	26.00		
Rudbeckia triloba	4	26.00		
Scrophularia marilandica	2	13.00		
Smilacina racemosa	2	13.00		
Zizia aurea	2	13.00		
TOTAL PLS weight	46.5	302.25		

Bag _____ of _____ Bag Weight: _____

SPENCE RESTORATION NURSERY

Woodland & Savanna Plants			6.5 ACRE(S)	
Davey Resource - Ottawa River Restoration				
Large Seed				
Species	PLS weight (oz)/acre	PLS weight (oz)/mix		
Bromus pubescens	32	208.00		
Elymus riparius	24	156.00		
Hystrix patula	24	156.00		
Elymus virginicus	32	208.00		
TOTAL PLS weight	112	728.00		

Bag _____ of _____ Bag Weight: _____

SPENCE RESTORATION NURSERY

Wet Mesic Prairie			0 ACRE(S)	
				
Temporary Crop Cover				
Species	PLS weight (lb)/acre	PLS weight (lb)/mix		
Annual Ryegrass	0	0.00		
TOTAL PLS weight	0	0.00		

SPENCE RESTORATION NURSERY

Wet Mesic Prairie			0 ACRE(S)	
				
Temporary Crop Cover				
Species	PLS weight (lb)/acre	PLS weight (lb)/mix		
Seed Oats	0	0.00		
TOTAL PLS weight	0	0.00		

Bag _____ of _____ Bag Weight: _____ Bag _____ of _____ Bag Weight: _____

Spence Seed	
Purchased Seed	
Mixing Time	
Office Time	
Total Spent	
Mix Value	
Difference	
% Realized	

SPENCE RESTORATION NURSERY

**Mesic Prairie & Riparian
Buffer Plants**

3 ACRE(S)

**Davey Resource - Ottawa
River Restoration**

Small Seed

Species	PLS weight (oz)/acre	PLS weight (oz)/mix
Carex cephalophora	2	6.00
Carex muhlenbergii	2	6.00
Sporobolus heterolepis	8	24.00
Allium cernuum	1	3.00
Anemone canadensis	1	3.00
Asclepias syriaca	2	6.00
Asclepias tuberosa	2	6.00
Aster laevis	2	6.00
Aster novae-angliae	2	6.00
Dodecatheon meadia	0.25	0.75
Echinacea purpurea	8	24.00
Gentiana andrewsii	2	6.00
Heliopsis helianthoides	8	24.00
Lespedeza capitata	4	12.00
Liatris aspera	2	6.00
Liatris spicata	2	6.00
Monarda fistulosa	1	3.00
Pedicularis canadensis	0.5	1.50
Penstemon digitalis	2	6.00
Penstemon hirsutus	2	6.00
Ratibida pinnata	8	24.00
Rudbeckia hirta	8	24.00
Solidago nemoralis	2	6.00
Solidago rigida	4	12.00
Tradescantia ohimensis	4	12.00
Veronicastrum virginicum	2	6.00
Zizia aurea	8	24.00
TOTAL PLS weight	89.75	269.25

Bag _____ of _____ Bag Weight: _____

SPENCE RESTORATION NURSERY

**Mesic Prairie &
Riparian Buffer Plants**

3

ACRE(S)

**Davey Resource -
Ottawa River
Restoration**

Large Seed

Species	PLS weight (oz)/acre	PLS weight (oz)/mix
Andropogon gerardii	48	144.00
Bouteloua curtipendula	32	96.00
Elymus canadensis	48	144.00
Silphium terebinthinaceum	4	12.00
TOTAL PLS weight	132	396.00

Bag _____ of _____ Bag Weight: _____

SPENCE RESTORATION NURSERY

Wet Mesic Prairie

0 ACRE(S)

**Temporary Crop Cover**

Species	PLS weight (lb)/acre	PLS weight (lb)/mix
Annual Ryegrass	0	0.00

SPENCE RESTORATION NURSERY

Wet Mesic Prairie

0

ACRE(S)

**Temporary Crop Cover**

Species	PLS weight (lb)/acre	PLS weight (lb)/mix
Seed Oats	0	0.00

TOTAL PLS weight	0	0.00
-------------------------	----------	-------------

TOTAL PLS weight	0	0.00
-------------------------	----------	-------------

Bag _____ of _____ Bag Weight: _____

Bag _____ of _____ Bag Weight: _____

Spence Seed	
Purchased Seed	
Mixing Time	
Office Time	
Total Spent	
Mix Value	
Difference	
% Realized	

Mailing List:

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Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
PO Box 7611
Washington, D.C. 20044-7611
Reference Case No. 90-5-1-1-08433

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City of Lima, Ohio

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419/228-5462 Fax 419/221-5199 www.cityhall.lima.oh.us

David J. Berger, Mayor

June 5, 2015

Addressees: Attached List

Re: *United States v. City of Lima*
Case No.: 3:14-cv-02551-JZ
Supplemental Environmental Project – Requested Schedule Modification

Dear Sir or Madam:

Pursuant to Paragraph 106 of the Consent Decree that was entered on November 19, 2014 in the above-referenced case (the "Consent Decree") and Paragraph 8 of Appendix F of the Consent Decree, the City of Lima (the "City") is requesting a non-material modification, to adjust the schedule in Appendix F for completion of the Supplemental Environmental Project (SEP). Specifically, the City is requesting that the completion date of November 30, 2015 be extended to June 30, 2016. This change does not affect the other dates listed in the table in Paragraph 6 of Appendix F.

Paragraph 26 states that "Lima is responsible for the satisfactory completion of the SEP in accordance with the requirements of this Decree" Paragraph 5 of Appendix F states "Lima shall maintain the plantings in good condition through the life of the Consent Decree" which is December 31, 2043. The City must therefore adopt a long-term perspective for the restoration project in the SEP.

The City engaged Geosyntec Consultants (an international engineering and science firm with natural resources, planning, and green infrastructure expertise) and Bassett and Associates (a local landscape architect and planning firm) to assist the City with planning and implementing the SEP. Bassett and Associates completed the ECOSystem evaluation and both firms collaborated to identify the most appropriate restoration approach to achieve the goal of a sustainable ecosystem 28 years from now. The firms also identified that the City will need to emphasize maintenance practices, including mowing and prescribed ecological burns, to prevent invasive species from taking over the re-planted sites in the initial years that the plantings are being established.

As discussed in Attachment A, the restoration team researched the most suitable tree species for the site, which include oaks and other related tree species. The team also developed proposed maintenance practices, which are described in Attachment B.

As described in Attachment A, the team consulted with two nurseries in Ohio and an unaffiliated restoration company that specializes in tree planting about the availability of these species to meet the fall planting deadline specified in the SEP. If Lima has to adhere to the fall 2015 schedule for planting of trees, then the following outcomes are expected:



- (1) Oaks and related species will not be available in the fall, resulting in Lima having to spend more money on long-term maintenance, since the prescribed burns would damage or kill the newly replanted trees;
- (2) If oaks and related species are available, the cost per tree will increase significantly, as the nursery will need to take extraordinary precautions to keep these alive during the summer; and
- (3) The nursery will not guarantee the survivability of the oaks and related species, resulting in increased costs for replanting in 2016 and 2017.

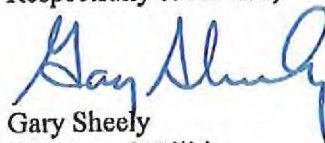
There are also several additional reasons why the tree planting schedule should be extended:

- During spring, summer, and fall of 2015, there will be numerous ongoing restoration activities, involving multiple contractors. The intensity of tree and brush clearing activities in spring-summer 2015 will effectively preclude tree planting in the same areas during spring 2015.
- While it may be possible to dig oaks and related tree species in spring 2015 and hold them over the summer for a fall 2015 planting, the resultant plantings will be more stressed and have significantly lower vitality than spring-planted trees. Consequently, nurseries strongly recommend spring planting. Fall-planted oak trees also are substantially more expensive than spring-planted trees and may be more difficult to warranty.
- Invasive species control will involve targeted use of herbicides over much of the restoration zone during the summer and fall of 2015. It would be desirable to avoid planting trees while these intensive invasive species control activities are occurring.

Therefore, in order to reasonably complete the SEP in a satisfactory manner by maintaining the plantings in good condition, the City requests that the schedule be extended to allow for tree planting in the spring of 2016. As set forth in Paragraph 8 of Appendix F, a modification of Appendix F is considered to be a non-material modification of the Decree. If U.S. EPA and the State agree to this modification, the City would be pleased to prepare an appropriate modification, for the parties to each sign, in accordance with Consent Decree Paragraph 106.

If necessary, the City would welcome the opportunity to have a technical conference call to further discuss this modification request. Thank you for your consideration.

Respectfully submitted,



Gary Sheely
Director of Utilities

Approved: _____



David J. Berger, Mayor

c: Adrienne Nemura
Howard Elstro
File



1420 Kensington Road, Suite 103
Oak Brook, Illinois 60523
PH 630.203.3340
FAX 630.203.3341
www.geosyntec.com

Memorandum

Date: May 26, 2015

To: Gary Sheely

Copies to: Kirk Niemeyer, Joe Gearing, Jim Morrissey, James Moscato

From: Dennis Dreher, Emily Campbell, Adrienne Nemura (Geosyntec Consultants),
Patrick Beam (Basset & Associates)

Subject: **Lima, Ohio Supplemental Environmental Project: Tree Planting Timeline**

To improve water quality and habitat along the Ottawa River corridor, a riparian restoration plan was developed. The restoration plan focuses on ecological sustainability while adhering to the requirements of the Supplemental Environmental Project (SEP) set forth in the Consent Decree. Those requirements include removing existing plant life and replanting with trees, grasses, and wildflowers by November 30, 2015 and the requirement that "Lima shall maintain the plantings in good conditions through the life of the Consent Decree" (December 31, 2043). However, in researching the most suitable tree species for the site, the restoration team identified that the timeline for the most desirable and sustainable restoration could not be feasibly completed in the duration specified in the SEP; instead tree planting needs to be extended into the Spring of 2016. This memo aims to outline the information that led the team to their conclusion.

ELEMENTS OF RESTORATION

The designed ecosystem is an open woodland resembling an oak savanna. Consistent with the requirements of the SEP, the restoration of the banks and riparian areas of the Ottawa River involves four principal elements:

- Clearing invasive and ecologically undesirable trees and brush;
- Elimination of small woody/brush resprouts and saplings and elimination of invasive weeds and grasses;
- Establishment of a native wildflower and grass cover; and
- Planting of trees.

Ottawa River Riparian Restoration and Tree Planting

May 26, 2015

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While clearing invasive trees is done in a relatively short timeframe, restoration is a long-term commitment. Invasive species are fast-growing, and have a large seed source on-site. Once the areas are cleared these seeds will likely sprout aggressively, and if not removed, will quickly overtake the areas that are being restored. Furthermore, native species may require multiple growing seasons to become fully established. As a result, restoration requires monitoring and adaptive management for at least 3 years, during which time additional invasive control, re-seeding, and re-planting may occur. A cover crop will be used to help mitigate invasive species in early years while the native species are becoming established.

Once native vegetation is fully established, the restoration area is intended to be maintained in the long-term using a regular schedule of prescribed fire. The resultant landscape will resemble an oak savanna, with mixed tree species that are tolerant of, and thrive in, prescribed burn regimes. The long-term use of prescribed fire also is an essential component to minimizing the return of invasive brush and weeds and maintaining a healthy understory of native grasses and forbs.

TREE PLANTING

An essential component of the SEP and the restoration plan is the planting of native tree species. Trees not only have aesthetic value to the local community, but help maintain the riparian ecosystem through water quality protection, soil stabilization, groundwater recharge, river shading, and aquatic habitat. The restoration team selected which tree species would be most ecologically valuable to the restoration through the following means:

- Tapping into the team's own knowledge base of which native species are most suited the local area, riparian areas, and surviving in disturbed areas.
- Consulting local nurseries, including the largest provider for the area, and the most specialized in restoration.
- Discussions with an unaffiliated restoration company that specializes in tree planting.
- Consideration to sustainability, including a long term maintenance plan that will include prescribed burning.

The restoration team, as noted above, selected tree species, primarily oaks, which are tolerant of and thrive in fire regimes. Oak trees, and some of the related species (hickories) that are recommended in the planting plan, are nearly always dug in the spring time, and planted shortly

Ottawa River Riparian Restoration and Tree Planting

May 26, 2015

Page 3

after for survivability. If Lima has to adhere to the fall 2015 schedule for planting of all trees, then the following outcomes are expected: (1) oaks and related species will not be available in the fall resulting in Lima having to spend more money on long-term maintenance since the prescribed burns would damage or kill the newly replanted trees; (2) if oaks and related species are available, the cost per tree will increase significantly as the nursery will need to take extraordinary precautions to keep these alive during the summer; and (3) the nursery will not guarantee the survivability of the oaks and related species, resulting in increased costs for replanting in 2016 and 2017. The restoration team believes this necessitates some flexibility in the original schedule which anticipated all of the restoration work occurring in 2015.

RATIONALE FOR SPRING PLANTING

During spring, summer, and fall of 2015, there will be numerous ongoing restoration activities, involving multiple contractors. The intensity of tree and brush clearing activities in spring-summer 2015 will effectively preclude tree planting in the same areas during spring 2015.

While it may be possible to dig oaks and related tree species in spring 2015 and hold them over the summer for a fall 2015 planting, the resultant plantings will be more stressed and have significantly lower vitality than spring-planted trees. Consequently, nurseries strongly recommend spring planting. Fall-planted oak trees also are substantially more expensive than spring-planted trees and may be more difficult to warranty.

Invasive species control will involve targeted use of herbicides over much of the restoration zone during the summer and fall of 2015. It would be desirable to avoid planting trees while these intensive invasive species control activities are occurring.

CONCLUSION

Due to the ecological value of oak species for this restoration, the restoration team respectfully recommends that the City meet with the agencies to request an extension of the SEP schedule through spring 2016 for tree planting. The team's professional opinion, formulated after extensive research and discussions with nurseries and restoration experts, is that the SEP extension is required to restore the banks and riparian areas of the Ottawa River in the most ecologically sound and sustainable way and to help make sure that Lima complies with the Consent Decree requirement to "maintain the plantings in good condition through the life of the Consent Decree".



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Memorandum

Date: May 26, 2015

To: Gary Sheely

Copies to: Kirk Niemeyer, Joe Gearing, Jim Morrissey, James Moscato

From: Dennis Dreher, Emily Campbell, Adrienne Nemura (Geosyntec Consultants),
Patrick Beam (Basset & Associates)

Subject: **Ottawa River Clearing, Restoration, Planting, Performance, Maintenance, and Monitoring Standards**

The purpose of these standards is to ensure that the overall design intent for clearing, restoring, and replanting the riparian zones of the Ottawa River is achieved, consistent with the requirements of the Supplemental Environmental Project (SEP). These standards focus on the initial clearing, restoration, and tree and plant establishment phases over a recommended two to three year implementation and monitoring period. These restored areas are intended to provide an aesthetic, healthy, diverse community of primarily native vegetation to meet the objectives of water quality protection, soil stabilization, groundwater recharge, river shading, and aquatic habitat, consistent with the SEP.

APPROACH

From the perspective of establishing clear, effective, and competitive bid proposals, it is envisioned that project implementation will have three principal elements:

- **Clearing and grubbing:** removal of large, medium and small invasive and undesirable trees and brush.
- **Ecologic restoration:** elimination of small woody/brush resprouts and saplings, elimination of invasive weeds and grasses, and establishment of a native wildflower and grass cover.
- **Tree establishment:** planting overstory trees to meet the requirements of the SEP.

For purposes of bid preparation, these elements may be combined or kept separate.

Ottawa River Riparian Restoration and Tree Planting Standards

May 26, 2015

Page 2

Successful achievement of this project will require adherence to performance criteria and associated monitoring protocols and short- and long-term maintenance and management of restoration zones. The performance standards are intended to help achieve the restoration and native plant establishment goals and the goal of fully complying with the requirements of the SEP to minimize “infestation of the area with invasive species” and to “maintain the plantings in good condition for the life of the Consent Decree”. The recommended approach and associated performance standards also are intended to produce a high quality end-product that will be aesthetically pleasing and will not burden the City’s maintenance capabilities or financial resources for the years to come. Therefore, it is important to provide reasonable performance standards to regulate the success of tree removal, restoration, and native planting tasks.

This approach will entail, as necessary, follow-up treatment, cutting, repair, re-seeding, and/or replanting to meet performance criteria during a two to three year period, as described below. This approach also includes preparation of annual reports by contractors summarizing monitoring data and documenting maintenance and remedial activities in response to stated performance criteria.

Clearing and Grubbing

The performance criteria for clearing and grubbing can be combined with the ecological restoration performance criteria.

Approach: Initial clearing of designated invasive trees and brush followed by multiple sweeps through management units after initial clearing to eliminate re-sprouts.

Performance Criteria: By the end of 2016, the contractor shall demonstrate that resprouts have been eliminated from at least 95 percent of the area where tree and brush cover is removed.

Monitoring: A meander approach through each “management unit” should be used to determine performance of removal and resprout control efforts.

Reporting: The contractor shall submit a brief annual report summarizing monitoring data, documenting maintenance and remedial activities in comparison to stated performance criteria.

Ottawa River Riparian Restoration and Tree Planting Standards

May 26, 2015

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Ecologic Restoration

Approach: Undesirable, invasive plant species -- including woody resprouts and seedlings and herbaceous weeds -- shall be removed by use of selective herbicide applications and/or physical removal (e.g., pulling or mowing). Removal efforts should be prioritized in 2015, with follow-up efforts in 2016 and 2017 to meet specific performance criteria. The timing and implementation of treatments of invasive species should be closely integrated with the establishment of native grasses and wildflowers and with the protection of any remnant native vegetation populations.

Native wildflowers, grasses, and sedges shall be established via seeding in each of the "management units". The timing of seeding should be coordinated with the treatment/removal of invasive/undesirable species in order to minimize unintended damage to native plant seedlings. In summer 2015, native grasses should be established to provide soil stabilization and a matrix to establish fuel for future controlled burns. In fall 2015, a wildflower seed mix should be installed to provide effective groundcover and wildlife habitat.

Performance Criteria:

- By the end of 2017, undesirable, invasive plant species shall not be prevalent in any of the management units. Total cover of invasive, weedy species, including but not limited to the following species, shall comprise no more than 5 percent of the cover within any "management unit".
 - Reed canary grass (*Phalaris arundinacea*)
 - Common reed (*Phragmites australis*)
 - Purple loosestrife (*Lythrum salicaria*)
 - Non-native thistle (*Cirsium spp.*, *Carduus spp.*)
 - Sweet clover (*Melilotus spp.*)
 - Crown vetch (*Coronilla varia*)
 - Wild parsnip (*Pastinaca sativa*)
 - Poison hemlock (*Conium maculatum*)
 - Burdock (*Arctium spp.*)
 - Garlic mustard (*Alliaria petiolata*)
 - Teasel (*Dipsacus spp.*)
 - Ragweed (*Ambrosia spp.*)
 - Kentucky bluegrass (*Poa pratensis*)
 - Buckthorn (*Rhamnus spp.*)
 - Honeysuckle (*Lonicera spp.*)

Ottawa River Riparian Restoration and Tree Planting Standards

May 26, 2015

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- Multiflora rose (*Rosa multiflora*)
 - Autumn olive (*Elaeagnus umbellata*)
 - Birdsfoot trefoil (*Lotus corniculatus*)
-
- A minimum of 20 species of native herbaceous plants are required to be established within any “management unit”. In addition, the success of the native plant seeding will be formally evaluated by the following vegetation performance standards monitored over time.
 - By the end of 2015, seeded areas should have 90 percent vegetation cover and no area greater than 1.0 meter square shall be bare soil. A cover crop of annual rye or oats may be used to help achieve this goal. If, by the end of the first full growing season, the planting fails to support the establishment of sufficient vegetation, then corrective measures regarding the fundamental design of the area and/or planting plan shall be required.
 - By the end of 2016, at least 60 percent of the permanent species planted in seed form should be evident. If this fails to occur, a determination must be made as to why and remedial action shall be necessary. Remediation may include overseeding of appropriate species.
 - By the end of 2017, at least 75 percent of the seeded permanent species are expected to be established. Alternatively, native perennial species that volunteer on the site, excluding undesirable invasive species, may also be counted in determining the preceding criteria. If the identified level of species development fails to occur, a determination must be made as to why, and a remedial action plan must be prepared and submitted to the City for approval. The approved remedial plan must be implemented and continued monitoring will be required beyond the third growing season until these performance criteria are met. Where the minimum performance standards cannot be achieved, a written explanation and alternative performance standards must be submitted for consideration by the City.
 - By the end of 2017, vegetation density (particularly grasses and sedges) shall be sufficient to support an effective burn over the majority of area within the “management units”. This will be demonstrated by one of more prescribed burns being conducted in the riparian restoration areas.

Monitoring: A meander approach through each “management unit” should be used to determine performance of invasive species control and establishment of native wildflowers and grasses. A

Ottawa River Riparian Restoration and Tree Planting Standards

May 26, 2015

Page 5

meander inventory shall determine overall vegetative cover, the total number of species, and the prevalence of undesirable/invasive species within each "management unit", consistent with specified performance criteria. This inventory is used to determine where follow-up seeding is needed and to identify, locate, and remove undesirable weedy species on a timely basis.

The contractor also shall establish permanent photographic monitoring location(s) for each "management unit". Photographs will be taken to document the establishment of vegetative cover, erosion problems, and other relevant maintenance concerns within each management unit identified in the landscape/planting plan. Photographs must be of satisfactory quality and resolution to accomplish the intent of the performance standards and shall be taken from the same locations during each monitoring event. A detailed description of the camera/photo location based on distance from a permanent structure, the orientation of the photo, and the vegetation zone being photographed shall be provided. Additional photos should be taken to document problem areas and remedial activities.

Monitoring is required annually for a minimum of three full growing seasons during and following restoration and planting. Under circumstances where the minimum performance standards cannot be achieved, alternative performance standards must be presented to the City for review and approval.

Reporting: The contractor shall submit a brief annual report summarizing monitoring data, documenting maintenance and remedial activities in comparison to stated performance criteria.

Tree Establishment

Approach: Tree planting will be done in the fall of 2015, with supplemental planting in the spring of 2016, if applicable. The recommended tree planting approach utilizes native species that are appropriate to local conditions with regard to soils, hydrology, and the disturbed status of the site. It emphasizes tree species, primarily oaks, tolerant of prescribed fire, which is the long-term management protocol for the restoration areas. Due to the disturbed status of the site, larger stock (2-2.5" caliper) is recommended for planting, either in balled and burlap or container form. A 2 year establishment (warranty) for the stock is required.

Recommended tree planting may include:

Ottawa River Riparian Restoration and Tree Planting Standards

May 26, 2015

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Common Name	Scientific Name	Form
Swamp White Oak	<i>Quercus bicolor</i>	Balled and Burlap or Container
Northern Pin Oak	<i>Quercus ellipsoidalis</i>	Balled and Burlap or Container
Bur Oak	<i>Quercus macrocarpa</i>	Balled and Burlap or Container
Red Oak	<i>Quercus rubra</i>	Balled and Burlap or Container
Bitternut Hickory	<i>Carya cordiformis</i>	Container
Shagbark Hickory	<i>Carya ovata</i>	Container
Sycamore	<i>Platanus occidentalis</i>	Balled and Burlap or Container

Performance Criteria: At the end of 2016, it is mandatory that at least 213 planted trees are surviving and thriving in order to meet the requirements of the SEP.

Monitoring: A mortality study once per growing season for 2 years should be done to determine living trees and the need for remedial action to meet performance criteria.

Reporting: Annual data and summary tables including percent mortality and stem counts (living and dead trees) for each management unit and each species is required to document performance.

SIGN OFF AND ACCEPTANCE

Approval and release of performance bonds and/or letters of credit shall not occur until a final inspection by the City verifies that performance criteria have been met.

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
WESTERN DIVISION**

THE UNITED STATES OF AMERICA,	)	
	)	
and	)	
	)	Case No.: 3:14-cv-02551-JZ
THE STATE OF OHIO	)	
	)	
Plaintiffs,	)	JUDGE JACK ZOUHARY
	)	
v.	)	
	)	
THE CITY OF LIMA, OHIO,	)	
	)	
Defendant.	)	

**STIPULATION MAKING NON-MATERIAL MODIFICATION
TO CONSENT DECREE**

The parties to this action enter into this stipulation and file it in this case to document their agreement to a non-material modification to the Consent Decree that the Court entered in this action on January 13, 2015 (Docket # 5). The non-material modification extends the time for the Defendant, the City of Lima ("Lima"), to complete an Ottawa River bank planting and revitalization project that the Consent Decree requires as a Supplemental Environmental Project ("SEP"). The parties agree that a seven-month extension of the SEP completion schedule – from November 30, 2015, to June 30, 2016 – is appropriate because Lima's engineering consultants and landscape architects have advised that oak trees and hickory trees will be more readily available and more successfully transplanted in the springtime.

The Consent Decree expressly allows the parties to adjust the SEP schedule by an agreed non-material modification, without further Court approval, so the parties seek no action by the Court in response to this filing.

1. Brief Background

On November 19, 2014, the United States and the State of Ohio filed a joint Complaint in this action alleging that Lima has violated the Clean Water Act and its implementing regulations, certain terms and conditions of Lima's National Pollutant Discharge Elimination System permit, and corresponding requirements under Ohio state law by discharging untreated sewage from its combined sewer system, partially treated wastewater that has bypassed full wastewater treatment, and raw wastewater from its sanitary sewer system into the environment. At the same time, the United States lodged a proposed Consent Decree that was designed to resolve the claims alleged in the Complaint on specified terms and conditions, which include Lima's commitments to: (i) make major upgrades and improvements to its wastewater treatment plant and sewer systems; (ii) pay a \$49,000 civil penalty; and (iii) perform a SEP that will make environmental enhancements to areas along the banks of the Ottawa River in Lima, at an expected cost of approximately \$218,000. The United States afforded an opportunity for public comment on the proposed Consent Decree but no comments were received. At the United States' request, the Court then approved and entered the Consent Decree on January 13, 2015.

Lima has already begun the initial stages of its Ottawa River bank revitalization SEP, including clearing invasive and ecologically undesirable trees and brush and seeding areas for establishment of a native wildflower grass cover. Under the schedule set in Consent Decree Appendix F (Docket # 5-6), the planting phase of the SEP was originally due to be completed by no later than November 30, 2015. However, Lima's engineering consultants and landscape architects have advised that oak trees and hickory trees will be more readily available and more successfully transplanted in the springtime (rather than this fall). The parties to the Consent

Decree have therefore agreed to extend Lima's deadline for completing the planting phase of the SEP until June 30, 2016, as set forth below.

The Consent Decree makes clear that any modification to the Appendix regarding the SEP shall be deemed a minor modification to the Consent Decree (*see* Docket #5-6 at p.2). The Consent Decree also specifies that non-material modifications to the Consent Decree "shall be in writing and signed by all Parties," but need not be approved by the Court (Docket #5 at ¶ 106).

2. Non-Material Consent Decree Modification.

For the reasons outlined above, the parties to the Consent Decree hereby agree that that the deadline for completing the planting phase of the Ottawa River bank revitalization SEP shall be extended by seven months – from November 30, 2105, to June 30, 2016 – through the following modification to the last row of the table in Paragraph 6 of Consent Decree Appendix F:

Task	Description	Schedule
4. Planting	Planting of trees, grasses, and wildflowers to revitalize the river bank.	November 30, 2015 <u>June 30, 2016</u>

IT IS SO STIPULATED AND AGREED.

Signature Page for Stipulation Making Non-Material Modification to Consent Decree in
United States and the State of Ohio v. City of Lima, Ohio, Case No. 3:14-cv-02551-JZ (N.D. Ohio)

For the United States of America

JOHN C. CRUDEN
Assistant Attorney General
Environment and Natural Resources Division

Dated: July 20, 2015

By:


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Of Counsel:

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Signature Page for Stipulation Making Non-Material Modification to Consent Decree in
United States and the State of Ohio v. City of Lima, Ohio, Case No. 3:14-cv-02551-JZ (N.D. Ohio)

For the State of Ohio

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s/ Summer J. Koladin Plantz
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For the City of Lima, Ohio

s/ David J. Berger

David J. Berger, Mayor

CERTIFICATE OF SERVICE

I hereby certify that, on this day, the foregoing Stipulation was filed electronically.
Notice of this filing will be sent to all parties by operation of the Court's Electronic Case Filing system. Parties may access this filing through the Court's system.

Dated: July 20, 2015

s/ Randall M. Stone



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TO: Emily Campbell, Geosyntec
FROM: Heather Bobich, Davey Resource Group
CC: Jacob Bannister
Rick Hanshaw
Joe Gregory
DATE: July 15, 2016
SUBJECT: SEP Assessment and Corrective Action Plan

Tree Removal

The tree removal has been successfully completed according to the SEP plan. Other than continuing to treat re-sprouts, no additional follow-up is recommended.

Seeding

Davey Resource Group has completed two seeding passes for all sections of the SEP project area, the first included seeding both the savanna and the prairie areas during the dormant season. The second seeding included seeding the disturbed areas around the perimeter of newly planted trees immediately following planting.

Woodland and Savanna Plantings

Species installed for the first seeding pass were consistent with those listed in the recommended seed mix outlined in the SEP plan. One species, blue-stemmed goldenrod (*Solidago caesia*), was not available in the trade and thus not included in the seed mix. Spence Nursery substituted the blue-stemmed goldenrod with golden alexanders (*Zizia aurea*), a flowering forb with a similar yellow flower.

Mesic Prairie and Riparian Buffer Plantings

Species installed for the first seeding pass were consistent with those listed in the recommended seed mix outlines in the SEP plan. Once species, little bluestem (*Schizachyrium scoparium* - referred to as *Andropogon scoparius* in the SEP plan), was not available and was replaced with big bluestem (*Andropogon gerardii*).

For the second seeding pass, a number of grasses and sedges that were included in the first seeding pass were not available in the trade. These species were not substituted due to the fact that they were already planted in the first seeding pass, and were thus present in the seed bank. In addition, Davey Resource Group anticipated that the small seeding areas immediately around the trees in the sunny portions of the site would not support the shade species specified in the SEP plan, therefore for trees in sunny exposed areas, a the mesic prairie mix was installed. Trees planted in the existing woodland areas in the SEP project area were planted with the woodland seed mix per the SEP specifications.

SEP Seeding Assessment

Davey Resource Group completed the first of two vegetation monitoring site visits in early June to assess native plants that had started to germinate at the site. First year native seedings are typically fairly sparse and dominated by forbs rather than grasses. The initial assessment was completed by performing a meander survey in each individual management unit of the SEP project area. All species observed were noted, assigned an approximate aerial coverage within each management unit, and were separated by vegetative community (ie. prairie versus woodland savanna areas).

Due to the early growth stages of most of the vegetation that is typically observed in the first monitoring pass during the first growing season following seed installation, the first monitoring visit provides more of a baseline assessment of the species currently growing and is not appropriate to determine the success of the first seeding pass or the viability of the seed mix as whole. During subsequent visits to the project site, a number of natives species from the seed mixes were observed to be successfully germinating and in various stages of growth. Once the second monitoring event is completed in August, when more vegetation has matured and a more complete cross section of the emerging and established vegetative community can be observed, the success of the winter 2016 prairie and savanna seeding passes can be better assessed. Seeded species observed during spring monitoring and subsequent site visits through the month of June were mostly still in the rosette stage of growth and often difficult to positively identify to the species, but through the end of June, seeded species that have been identified on the SEP project site are indicated in the tables included in Attachment 1.

Davey Resource Group recommends that it may be premature to indicate to the monitoring agencies that a remedial seeding plan is necessary or that the seeding has failed.. The first and second growing seasons following a native seeding are typically tremendously different as far as what emerges. While Davey Resource Group planned for and recommends supplemental seeding in 2016 and spring of 2017, the amount of growth present in the first three months of growth following seeding are not indicative or representative of the success of the seeding. Late summer monitoring will provide additional important growth and germination patterns that will to offer guidance in planning the supplemental seeding.

Supplement Seeding Action Plan

Germination Challenges

While the overall success of the seeding is not assessed to be problematic at this time, notably missing from the new growth in the seeding areas was a consistent presence of cover crop. In addition, seed germination in the gravelly or sloped areas was, as anticipated, poor. Davey Resource Group will be performing an overseeding of cover crop (annual oats and rye) still yet this summer, and then will be performing a second installation of the seed mixes in the fall/winter of 2016, prior to the spring of 2017.

Native seed germination has been hampered in some of the drill-seeded areas by thick mats of black medic (*Medicago lupulina*), a non-native weed originating in Eurasia and North

Africa. It is a common weed in lawns, gardens, waste areas, roadsides, pastures, and cropland. Black medic is a low-growing, spreading annual or short-lived perennial (depending up climate conditions), that reproduces by seed and grows well in dry soil, soil low in nitrogen, compacted soil, and in sparse lawns. It is likely that the removal of the turf grass created favorable conditions for it to emerge this spring and quickly form dense mats that are inhibiting the germination of the native seed in some of the SEP sections.. A positive aspect of black medic is that it produces nitrogen through an association with soil bacteria, and can provide benefits to the soils at the SEP site. That said, it is a problem at the site and needs to be addressed.

The key to reducing black medic is preventing seed production. Small patches of it can be removed - ideally before seed production - by hand pulling when soils are moist, hoeing, tilling, or digging. Black medic growing in the SEP project site tends to be present in large patches and appears to be preventing any germination of the native seed or cover crop, so an appropriate approach at the SEP project site will be to till the areas and re-seed them. This should both break up the mat of black medic shading out the ground surface and aerate the soil sufficiently to make growth conditions less favorable for the black medic and more favorable for the native seed and cover crop. Turning the black medic into the soil will also provide beneficial nutrients to assist with native plant germination. Black medic does not thrive in the shade, so getting a solid cover crop established will also help reduce resurgence of the weed. If appropriate, topsoil may be placed and mixed into the soil where tilling is performed.

For areas where germination of hand broadcast seed was poor, Davey Resource Group will place topsoil to help increase germination. Sloped areas and rocky areas will be treated on an individual basis with consultation from the project designer. Areas of bare soil will be over seeded with a cover crop in late July/early August. Areas currently vegetated will not be overseeded with a cover crop this summer, unless the area is poorly vegetated due to the treatment of undesirable species.

For supplemental seeding, Davey Resource Group will also plant the woodland savanna seed mix around the trees as specified in the SEP.

In addition, Davey Resource Group will be performing selective mowing and cutting to help control weeds and tall growth along the SEP corridor after they have reached a height of approximately 12 inches, generally every thirty days during the growing season.

Replacements and Seed Availability

Prior to the second seeding pass, Davey Resource Group will obtain the list of available species from the native seed nursery and coordinate with the project designer for approval of any potential substitutions that need to be made due to the lack of availability of any species detailed in the project specifications. No substitutions will be made without written prior approval from the project designer.

It is standard practice for native seed nurseries to reach out to their competitors in an attempt to obtain species of seed that they do not have available in their own nurseries. When the term "not available in the trade" is used, it means that the nursery has completed this outreach and found that the other nurseries also do not have it available. This occurred during the original seed purchase process. For future seeding events, Davey Resource Group will confirm with their seed provider, Spence Nursery, that any species that Spence does not carry or have available were pursued through other nurseries, and will provide documentation of which nurseries were contacted. Previously substituted species, big bluestem and golden alexander, will not be included in the mixes to be installed in the future.

Tree Planting

Installation

Davey Resource Group completed installation of 213 balled and burlapped trees per the SEP plan. Planting locations were individually decided upon within each section of the SEP project area with the project Landscape Architect. Installation of the trees occurred during the dormant season.

Spring Inspection

During spring tree inspections, the last of which occurred in late May during monitoring visits, many of the trees - sycamores, redbuds, and pin oaks in particular, were starting to leaf out, but inconsistently. Typically by late May most of the trees should have been almost fully leafed out. Other trees species that were planted were not leafing out, but still had green twigs, indicating that they were alive. During the June 17 site meeting between Geosyntec, Davey Resource Group, the Davey Tree Nursery, and the City of Lima, almost all of the trees that had started to leaf out had died, and the trees that had green twigs in late May were also dead. Tree mortality was estimated at 100% and the dead trees were immediately removed.

Mortality

In the June 24, 2016, memo entitled "Tree Removal, Seeding, and Tree Planting," it was indicated that a preliminary review of weather data from the date of the tree planting was somewhat inconclusive and did not point out any obvious weather event that may have turned out to be a single "kill" event, and Davey Resource Group was awaiting additional information from the nursery.

Additional information regarding rainfall amounts and temperature trends was gathered in order to assess the tree mortality (please see the NOAA data for the City of Lima taken at the Lima Wastewater Treatment Plant in Attachment 1). In addition, quality of stock, tree transport, installation methods, and post-installation maintenance were assessed.

The following assessment regarding the tree mortality must be read with the understanding that providing a single definitive causal factor for the total loss of the tree plantings may not be feasible, but an assessment of a combination of factors may provide a comprehensive explanation behind the loss of the trees and help with planning the replacement of the trees. The total loss of an entire tree planting is an unprecedented event for the Davey companies, and trying to understand why the trees died is extremely important in helping to insure the success of the warranty plantings, which will be completed at no cost to the City of Lima.

Tree Transport

Trees were transported to the project site on two 48-foot drop-deck tractor trailers and were covered with shade tarps. The tarps protected trees from wind scald, dehydration, possible road salt. This transport method is standard practice and has been used to transport trees for many successful projects. It is Davey's assessment that the method of transport did not contribute to tree mortality.

Tree Stock Quality

The Davey Nursery provided quality stock of appropriate size according to the project specifications. The recommended caliper for the trees according to the project specifications was adhered to and the project designer on site approved the stock prior to installation. Tree caliper for balled and burlapped trees is measured at 6 inches above grade for trees up to

4-inch diameter and the stock met the caliper requirements. All trees were dormant at the time of planting and were dug using standard nursery practice and care. It is Davey's assessment that the quality of stock did not contribute to tree mortality.

Tree Installation

Other than the timing of planting, the trees were planted according to project specifications and it is Davey's assessment that the method of planting did not contribute to tree mortality.

Prior to installation, Davey Resource Group and the Davey Nursery made a recommendation to the City that all trees specified in the plan could be planted in the spring, and that the Davey Nursery had experienced good results with planting both the oak species and the other deciduous species in the early spring. The City agreed to allow the trees to be planted in a single planting event, in early spring of 2016. Due to the warmer than usual winter, the Davey Nursery moved the planting date up to mid-February and the trees were installed February 19, 2016.

Weather Conditions

As mentioned above, pinning down a single event that may have contributed to the loss of the trees may not be feasible, but a comprehensive understanding of a combination of factors that may have led to tree mortality is certainly worth discussing. Additional information regarding rainfall amounts and temperature trends was gathered in an attempt to assess the tree mortality (Attachment 2).

On the day of the tree installation, which started on February 19, 2016, the low temperature was 22 degrees and reached a high of 43 degrees. There were snow flurries in the morning which tapered off as the temperature rose above freezing.

According to the NOAA weather data, there were multiple wide fluctuations in temperatures following installation that were hard on the already stressed newly planted trees. Temperatures immediately following installation quickly rose to the high 60s in the daytime, while still dropping below freezing at night. For example, the high on February 21 was 68°F and gradually fell back to a high of 31°F on the 27th. Even though temperatures were warm during this period, the lows were still in the mid 20s. This trend continued through May, when the trees should have been starting to leaf out and the danger of frost damage increased. The period of April 2nd through the 17th saw a long trend of highs that gradually climbed from the 40s and 50s at the beginning of the month, to the high 70s by the middle of the month. Still during this period however, the lows remaining consistently below freezing.

Davey Resource Group made visits to the site on March 8 and April 20. In March, the trees that were checked had green twigs and small live buds, and while each individual tree was not checked, conditions on site with soil and weather were appropriate for the year - root balls were not dry and no visible damage to the trees was observed. On April 20, the site overall was drier, but the soil around the trees was still moist below grade. Rain was forecasted through the following week, and the area received over two inches of rain during the following two weeks. A few trees were pushing leaves, but a delay in leaf out was not of concern at that point due to the stress that newly planted trees are subjected to. Davey Resource Group was on site on June 2 and 3 performing spring vegetation monitoring, and at that time a large number of the sycamore trees were starting to leaf out, but many of the other trees had few if any leaves on them. While each tree was not individually assessed for mortality at that time, the sample set selected, each section of the SEP had live trees that were either starting to leaf out or had buds and/or green twigs, indicating that they were still alive. In addition, the soil in the root balls was moist. At this time, it was decided that tree bags would need to be placed on each tree during the month of June.

While the lack of fully leafed out trees in early June was of concern, it was Davey Resource Group's opinion that the trees had experienced a late frost that had either killed off the first leaves or delayed leafing out altogether. The presence of new leaves, live buds, and live twigs, indicated that the trees were likely recovering from a potential late frost. According to NOAA data and the *Arboriculture - the Integrated Management of Landscape Trees, Shrubs, and Vines* (4th Edition), there were at least three events well into the spring season that may have led to frost damage on the trees. According to *Arboriculture*, "frost can occur in clear calm conditions at 40 degrees and below". The NOAA weather data supports that this occurred consistently through early April, and then again at least three times through the month of May, when the trees would have been actively leafing out.

In addition to widely fluctuating temperatures and the likelihood of frost stress following tree installation, there was a period in from May 22 through June 1 where temperatures were consistently above average and rainfall was below average. While the root balls of the trees were moist on the day of spring monitoring, it is possible that it was only due to recent rain which masked the dry down that had occurred in the week prior, and that the trees had not yet shown signs of heat or dry conditions. When the dead trees were discovered during the June 17, site visit, a recent rain of 0.92 inch moistened the root balls, but again likely masked a prior hot dry period between June 7 and June 14, that may have been the final stressor that contributed to the mortality of the trees.

It is Davey Resource Group's assessment that environmental conditions; wide fluctuations in temperature along with a possible late frost, followed by two periods of warm dry weather, may have contributed to the mortality of the already sensitive newly planted trees.

Tree Corrective Action Plan

The Davey Tree Nursery will replace 100% of the trees per the SEP plan in the late of fall of 2016 and spring of 2017. The timing of the replants shall be according to the SEP specifications:

- Deciduous Trees, particularly oaks: March 1 to June 1
- Deciduous Trees, *except* oaks: October 1 to December 1

In order to support healthy growth and survival potential, the trees will be dug with larger root balls to help preserve as much of the intact root mass as possible, helping reduce the stress to the newly planted trees. In addition, if the City agrees to it, Davey Resource Group will plant all the trees in the spring, after risk of frost, if the project team agrees that this may be the best approach to minimize the risk of frost.

Because the replants will be installed within the growing seasons of 2016 and 2017, each tree will be thoroughly watered following install and Davey Resource Group will commence with weekly tree inspections until the fall plantings are dormant in late 2016, and commencing again at the beginning of the growing season (estimated as late February/early March for the Lima area) in 2017. During dormancy, Davey Resource Group will visit the site monthly to assess the condition of the overwintering trees. Davey Resource Group will provide a written follow-up to Geosyntec within three business days of each tree inspection site visit and will coordinate closely with Geosyntec regarding any preventative measures that may be needed to protect the warranty trees and prevent mortality.

ATTACHMENT 1

Woodland and Savanna Plants

<u>Grasses and Sedges</u>		<u>Present As of June 30, 2016*</u>
<i>Bromus pubescens</i>	Hairy Woodland Brome	No
<i>Carex normalis</i>	Spreading Oval Sedge	No
<i>Carex cephalophora</i>	Short-headed Bracted Sedge	No
<i>Carex sparganioides</i>	Burreed Sedge	No
<i>Diarrhena obovata</i>	Beak Grass	No
<i>Elymus riparius</i>	Riverbank Wild Rye	Possibly**
<i>Hystrix patula</i>	Bottlebrush Grass	Possible**
<i>Elymus virginicus</i>	Virginia Wild Rye	Possibly**
<u>Forbs</u>		
<i>Allium cernuum</i>	Nodding Wild Onion	Yes
<i>Anenome Virginiana</i>	Tall Thimbleweed	No
<i>Aquilegia canadensis</i>	Wild Columbine	No
<i>Arisaema triphyllum</i>	Jack-in-Pulpit	No
<i>Aster cordifolius</i>	Heart-leaved Aster	No
<i>Aster shortii</i>	Short's Aster	No
<i>Blephilia hirsuta</i>	Hairy Wood Mint	No
<i>Campanula americana</i>	American Bellflower	No
<i>Dodecatheon meadia</i>	Shooting Star	No
<i>Eupatorium purpureum</i>	Purple Joe Pye Weed	Yes
<i>Geranium maculatum</i>	Wild Geranium	No
<i>Heliopsis helianthoides</i>	False Sunflower	Yes
<i>Mondarda fistulosa</i>	Bee Balm	Yes
<i>Pestemon calysosus</i>	Smooth Beardtongue	No
<i>Polygonatum pubescens</i>	Hairy Solomon's Seal	No
<i>Rudbeckia hirta</i>	Black-eyed Susan	Yes
<i>Rudbeckia triloba</i>	Brown-eyed Susan	Yes
<i>Scrophularia marilandica</i>	Late Figwort	No
<i>Smilacina racemosa</i>	False Solomon's Seal	No
<i>Solidago caesia</i>	Blue-stemmed goldenrod	No***

* Many seeded species will not emerge the first year following seeding, particularly some of the grass species. In addition, many of the species that do emerge in the first growing season may emerge later in the summer and will be noted in the August monitoring visits and during subsequent maintenance visits.

***Elymus* spp. were observed on site, but they were newly emerged and species was not determined

****Solidago caesia* was not available for the seed mix

Mesic Prairie and Riparian Buffer Plants

Grasses and Sedges		Present As of June 30, 2016*
<i>Andropogon scoparius</i>	Little Bluestem	No***
<i>Bouteloua curtipendula</i>	Side Oats Grama	No
<i>Carex cephalophora</i>	Short-headed Bract Sedge	No
<i>Carex muhlenbergii</i>	Sand-bracted Sedge	No
<i>Elymus canadensis</i>	Canada Wild Rye	Yes
<i>Sporobolus heterolepis</i>	Prairie Dropseed	No
Forbs		
<i>Allium cernuum</i>	Nodding Wild Onion	Yes
<i>Anemone canadensis</i>	Canada Anemone	No
<i>Asclepias syriaca</i>	Common milkweed	Yes
<i>Asclepias tuberosa</i>	Butterfly milkweed	No
<i>Aster laevis</i>	Smooth Blue Aster	No
<i>Aster Novae-angliae</i>	New England Aster	Yes
<i>Dodecatheon meadia</i>	Shooting Star	No
<i>Echniacea purpurea</i>	Purple Coneflower	Yes
<i>Gentiana andrewsii</i>	Bottle Gentian	No
<i>Heliopsis helianthoides</i>	False Sunflower	Yes
<i>Lespedeza capitata</i>	Round-headed Bush Clover	No
<i>Liatris aspera</i>	Rough Blazing Star	No
<i>Liatris spicata</i>	Marsh Blazing Star	No
<i>Monarda fistulosa</i>	Wild Bergamot	Yes
<i>Pedicularis canadensis</i>	Wood Betony	No
<i>Penstemon digitalis</i>	Fox Glove Beard Tongue	No
<i>Penstemon hirsutus</i>	Hairy Beard Tongue	No
<i>Ratibida pinnata</i>	Yellow Coneflower	Yes
<i>Rudbeckia hirta</i>	Black-eyed Susan	Yes
<i>Silphium</i>	Prairie Dock	No
<i>Solidago rigida</i>	Stiff Goldenrod	No
<i>Tradescantia ohimensis</i>	Ohio Spiderwort	No
<i>Veronicastrum virginicum</i>	Culver's Root	No
<i>Zizia aurea</i>	Golden Alexander	No

* Many seeded species will not emerge the first year following seeding, particularly some of the grass species. In addition, many of the species that do emerge in the first growing season may emerge later in the summer and will be noted in the August monitoring visits and during subsequent maintenance visits.

***Elymus* spp. were observed on site, but they were newly emerged and species was not determined

*** *Solidago caesia* was not available for the seed mix

ATTACHMENT 2

Date	Precipitation (inches)	Max Temp	Minimum Temp
January 1, 2016	0	30	25
January 2, 2016	0	28	24
January 3, 2016	0	35	27
January 4, 2016	0.03	31	24
January 5, 2016	0	29	14
January 6, 2016	0	31	16
January 7, 2016	0	39	23
January 8, 2016	0	48	32
January 9, 2016	0.38	48	37
January 10, 2016	0.62	50	34
January 11, 2016	0.019	34	6
January 12, 2016	0.09	29	6
January 13, 2016	0	27	2
January 14, 2016	0.1	28	1
January 15, 2016	0	45	27
January 16, 2016	0.22	45	31
January 17, 2016	0	32	23
January 18, 2016	0	23	2
January 19, 2016	0	12	2
January 20, 2016	0	19	4
January 21, 2016	0.05	20	4
January 22, 2016	0	24	6
January 23, 2016	0	28	18
January 24, 2016	0	31	17
January 25, 2016	0	35	18
January 26, 2016	0.02	46	28
January 27, 2016	0	46	24
January 28, 2016	0	31	25
January 29, 2016	0	42	25
January 30, 2016	0	37	25
January 31, 2016	0	55	36
February 1, 2016	0.07	56	36
February 2, 2016	0	45	27
February 3, 2016	0.9	58	34
February 4, 2016	0	55	29
February 5, 2016	0	29	20
February 6, 2016	0	40	21
February 7, 2016	0	39	24
February 8, 2016	0	51	34
February 9, 2016	0	40	25

Date	Precipitation (inches)	Max Temp	Minimum Temp	
February 10, 201	0	26	15	
February 11, 201	0	21	13	
February 12, 201	0	21	12	
February 13, 201	0.01	24	5	
February 14, 201	0.01	15	2	
February 15, 201	0.01	22	3	
February 16, 201	0	33	21	
February 17, 201	0	30	28	
February 18, 201	0	36	22	
February 19, 201	0	43	23	Tree Install
February 20, 201	0	61	43	
February 21, 201	0	68	33	
February 22, 201	0	51	26	
February 23, 201	0	45	26	
February 24, 201	0.52	48	28	
February 25, 201	1.2	37	28	
February 26, 201	0.08	33	25	
February 27, 201	0	31	26	
February 28, 201	0	47	28	
February 29, 201	0.08	64	35	
March 1, 2016	0	52	30	
March 2, 2016	0.62	48	21	
March 3, 2016	0	31	21	
March 4, 2016	0.24	33	27	
March 5, 2016	0	32	27	
March 6, 2016	0.08	36	31	
March 7, 2016	0	45	31	
March 8, 2016	0	60	43	
March 9, 2016	0	71	53	
March 10, 2016	0.74	65	56	
March 11, 2016	0.5	58	43	
March 12, 2016	0	50	33	
March 13, 2016	0.25	60	33	
March 14, 2016	0.39	58	47	
March 15, 2016	0.09	65	49	
March 16, 2016	0	63	49	
March 17, 2016	0	59	43	
March 18, 2016	0	57	39	
March 19, 2016	0	51	33	
March 20, 2016	0	44	26	
March 21, 2016	0	44	26	

Date	Precipitation (inches)	Max Temp	Minimum Temp
March 22, 2016	0	49	27
March 23, 2016	0	62	40
March 24, 2016	0	62	50
March 25, 2016	0.68	65	33
March 26, 2016	0	42	32
March 27, 2016	0	57	33
March 28, 2016	0.66	73	34
March 29, 2016	0	47	30
March 30, 2016	0	53	30
March 31, 2016	0.25	66	39
April 1, 2016	0.42	66	44
April 2, 2016	0.21	52	35
April 3, 2016	0.09	44	26
April 4, 2016	0	57	26
April 5, 2016	0	49	26
April 6, 2016	0	43	25
April 7, 2016	0.28	61	25
April 8, 2016	0.98	43	30
April 9, 2016	0.15	41	24
April 10, 2016	0.03	35	24
April 11, 2016	0.1	55	28
April 12, 2016	0.31	55	30
April 13, 2016	0	51	31
April 14, 2016	0	55	30
April 15, 2016	0	61	31
April 16, 2016	0	74	35
April 17, 2016	0	77	35
April 18, 2016	0	80	44
April 19, 2016	0	81	49
April 20, 2016	0	65	46
April 21, 2016	0	79	46
April 22, 2016	0.2	65	55
April 23, 2016	0.1	60	40
April 24, 2016	0	60	40
April 25, 2016	0	72	40
April 26, 2016	0.16	79	58
April 27, 2016	0.01	78	42
April 28, 2016	0.62	60	41
April 29, 2016	0.16	52	43
April 30, 2016	0	53	41
May 1, 2016	0.74	58	47

Date	Precipitation (inches)	Max Temp	Minimum Temp
May 2, 2016	0.77	71	48
May 3, 2016	0.02	53	47
May 4, 2016	0	60	47
May 5, 2016	0.08	56	40
May 6, 2016	0.14	65	40
May 7, 2016	0	70	45
May 8, 2016	0.03	75	41
May 9, 2016	0	75	40
May 10, 2016	0.4	56	49
May 11, 2016	0.15	69	53
May 12, 2016	0	75	60
May 13, 2016	0.66	78	51
May 14, 2016	0.12	65	46
May 15, 2016	0	50	39
May 16, 2016	0	51	37
May 17, 2016	0.02	64	38
May 18, 2016	0.32	60	48
May 19, 2016	0	65	41
May 20, 2016	0	71	42
May 21, 2016	0.14	72	51
May 22, 2016	0	68	47
May 23, 2016	0	74	42
May 24, 2016	0	77	44
May 25, 2016	0	82	56
May 26, 2016	0	83	64
May 27, 2016	0	81	64
May 28, 2016	0	88	64
May 29, 2016	0.11	85	66
May 30, 2016	0	87	60
May 31, 2016	0	85	60
June 1, 2016	0	87	63
June 2, 2016	0.12	87	63
June 3, 2016	0	84	57
June 4, 2016	0.04	84	57
June 5, 2016	1.34	76	63
June 6, 2016	0.08	76	64
June 7, 2016	0	83	55
June 8, 2016	0	66	48
June 9, 2016	0	73	46
June 10, 2016	0	76	48
June 11, 2016	0	82	66

Date	Precipitation (inches)	Max Temp	Minimum Temp
June 12, 2016	0	92	73
June 13, 2016	0	83	55
June 14, 2016	0	83	57
June 15, 2016	0.04	77	63
June 16, 2016	0.92	88	65
June 17, 2016	Meeting		

Source: <https://www.ncdc.noaa.gov/cdo-web/datasets#GHCND>