



**CONESTOGA-ROVERS
& ASSOCIATES**

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October 16, 2013

Reference No. 017368

Mr. Brad Stimple
U.S. EPA Region 5 – Cleveland Office
25089 Center Ridge Road
Westlake, OH 44145

Dear Mr. Stimple:

Re: Submittal of the 2012 Parcel 22 Annual Monitoring Report and
Completion of Restoration Monitoring Requirements for Interim
Operation, Maintenance, and Monitoring Plan for the
Parcel 22 Removal Action
Administrative Order on Consent for Removal Action
Docket No. V-W-'03-C-747
GM CET Bedford Facility
Bedford, Indiana

Conestoga-Rovers and Associates (CRA), on behalf of General Motors LLC (GM), is submitting the 2012 Parcel 22 Monitoring Report (Report) documenting the findings of the 2012 spring inspection of the restored channel of Bailey's Branch Creek and adjacent riparian areas on Parcel 22. This letter is also to notify U.S. Environmental Protection Agency (U.S. EPA) that GM believes it has satisfied the restoration monitoring requirements of the Interim Operation, Maintenance, and Monitoring Plan (IOMMP) for the Parcel 22 Removal Action (RA), and is therefore notifying U.S. EPA of cessation of future inspections and monitoring of the completed Parcel 22 restoration.

Consistent with the submittal requirements of the Administrative Order on Consent (AOC) for Removal Action Proceeding Under Sections 104, 106(a), 107, and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. SS 9604, 9606(a), 9607, and 9622 (U.S. EPA Docket No.: V-W-'03-C-747) effective July 31, 2003, GM submitted the Parcel 22 IOMMP concurrent with the Parcel 22 RA Construction Certification Report dated May 14, 2010. These documents were approved by U.S. EPA via e-mail dated April 11, 2011 and Indiana Department of Environmental Management (IDEM) on April 12, 2011. The IOMMP presented the procedures and protocols to conduct routine monitoring and maintenance activities for Parcel 22. The location of Parcel 22 (Site) is presented on Figure 1 of the enclosed Report.

Pursuant to the restoration monitoring requirements of the IOMMP, inspections of Parcel 22 were conducted twice annually, Spring and Fall, for a period of two years. Inspections were completed the Fall (the week of September 27) of 2010, the Summer (June 23) and Fall



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(September 29) of 2011, and the Spring (May 31) of 2012. The results of the inspections conducted on Parcel 22 were submitted to the U.S. EPA in the form of Annual Monitoring Reports dated February 2011 (covering the 2010 inspection), July 2012 (covering the two 2011 inspections), and October 2013 (covering the 2012 inspection). The Spring 2012 (May 31) inspection was the fourth and final scheduled inspection, and based on the observations made during that inspection of Parcel 22, no maintenance activities were recommended.

Based on the 2012 inspection, it is our opinion that the restoration on Parcel 22 is well established and no further monitoring is warranted. Therefore, GM would like to notify U.S. EPA that the restoration monitoring requirements of the Parcel 22 IOMMP have been satisfied and no further inspections of Parcel 22 will be scheduled.

Should you have any questions regarding this document, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

For J.M.
James J. McGuigan, P.E.

LS/cs/4

Encl.

c.c.: Peter Ramanauskas, U.S. EPA
Gerald O'Callaghan, IDEM
Cheryl Hiatt, GM LLC
Ed Peterson, GM LLC
Nicholas Schapman, CRA



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REPORT

2012 PARCEL 22 MONITORING REPORT

BAILEY'S BRANCH AND PLEASANT RUN
REMOVAL ACTION
BEDFORD, INDIANA

Prepared for: General Motors LLC

Conestoga-Rovers & Associates

651 Colby Drive
Waterloo, Ontario N2V 1C2

October 2013 • #017368

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APPENDIX B SPRING 2012 VEGETATIVE ASSESSMENT FIELD FORMS

LIST OF ACRONYMS AND TERMS

AOC	Administrative Order on Consent
Bailey's Branch Creek	Bailey's Branch Creek at the upstream end of Pleasant Run Watershed
CA	Corrective Action
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CET	Castings Engines Transmissions
CRA	Conestoga-Rovers & Associates Inc.
Facility	GM CET Bedford Facility
GM	General Motors LLC
IDNR	Indiana Department of Natural Resources
IOMMP	Interim Operation, Maintenance, and Monitoring Plan
RA	Removal Action
Report	2012 Parcel 22 Monitoring Report
RCRA	Resource Conservation and Recovery Act
TSCA	Toxic Substances Control Act
U.S. EPA	United States Environmental Protection Agency

1.0 INTRODUCTION

Conestoga-Rovers and Associates, Inc. (CRA) has prepared this 2012 Parcel 22 Monitoring Report (Report), on behalf of General Motors LLC (GM), documenting the findings of the 2012 Spring inspection of Parcel 22, the restored channel of Bailey's Branch Creek and adjacent riparian areas located on this parcel, downstream of the GM Castings Engines Transmissions (CET) Bedford Facility (Facility), located in Bedford, Indiana. This Report has been prepared in accordance with the requirements of the Administrative Order On Consent (AOC, United States Environmental Protection Agency [U.S. EPA] Docket No.: V-W-'03-C-747), effective July 31, 2003, for Removal Action (RA) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and consistent with the requirements of the Toxic Substances Control Act (TSCA) and the Resource Conservation and Recovery Act (RCRA) Corrective Action (CA) work conducted under the Performance Based Agreement executed on March 20, 2001, and modified on October 1, 2002, March 29, 2007, and May 9, 2008, for the Facility.

The 2012 inspection was completed on May 31, 2012, in accordance with the Parcel 22 Interim Operation, Maintenance, and Monitoring Plan (IOMMP) (CRA, May 14, 2010). The location of Parcel 22 relative to the GM CET Bedford Facility is presented on Figure 1.1.

2.0 **BACKGROUND**

The Parcel 22 RA included removal of impacted soil, rock, and sediment from the creek and soil from the floodplain area for off-Site disposal and restoration of the creek and adjacent habitats in the affected areas. The creek channel, riparian corridor, and floodplain were restored to generally similar conditions to those that existed prior to the cleanup activities, using clean soil and aggregate materials. Restoration of the creek channel also included the construction of in-stream features such as pool-riffle sequences and bank stabilization structures. The riparian corridor and floodplain, in addition to the property owners' yard, were returned to generally similar conditions and vegetated with a variety of native seed mixes, shrubs and trees (combination of seedlings and specimens with diameters of 1 inch or greater) consistent with the property owners' request. Table 2.1 presents a summary of vegetation installed, including the specific seed mixes applied.

3.0 RESTORATION MONITORING

The following sections outline monitoring activities undertaken. The Spring 2012 inspection included a field reconnaissance to assess creek channel stability, extent and nature of vegetative cover, and status of the habitat features. A photographic log was used to document conditions along the stream channel and vegetation in the adjacent riparian corridor. The photographic log can be found in Appendix A. The vegetative assessment was completed and documented using the monitoring form provided in the Parcel 22 IOMMP (CRA 2010) and is provided in Appendix B.

3.1 CREEK STABILIZATION

A continuous photographic log was completed along the creek channel to document its stability and natural evolution.

The banks along the length of the creek channel were well vegetated and did not show significant amounts of erosion, undercutting or failure. Signs of minor and anticipated erosion along the creek banks (e.g., rill erosion, local scour) and floodplain were documented. These natural evolutionary changes were expected in the original design.

In general, the creek channel appears to be stable. It has not moved or shifted significantly since the restoration activities were completed nor are there signs indicating any such instability may occur in the short term.

The creek substrate within the creek channel continues to undergo natural sorting, forming a smaller meandering channel with point bars in the larger overall creek channel. The photographic log presented in Appendix A illustrates the creek substrate at various locations along the creek, consisting of stones of all sizes.

A number of rock current deflectors were installed as part of the Parcel 22 RA restoration to promote the formation of pool-riffle sequences within the channel during the early stages after restoration. The rock current deflectors remain largely intact and are documented within the photographic log included in Appendix A.

The presence or lack of pool-riffle sequences and waterfalls were also assessed. It should be noted that natural processes are expected to modify the creek through time and the weirs (i.e., rock current deflectors installed to create pool-riffle sequences) placed during restoration are expected to be altered, moved or even removed, once natural processes take over.

3.2 VEGETATIVE COVERAGE

Areas adjacent to the restored creek channel (riparian zone) were re-vegetated after cleanup by applying diverse seed mixes of native grasses and forbs and planting native shrubs and trees to promote succession to re-establish native habitats. Due to the relatively small size of the restored riparian zones, ground truthing during the monitoring events encompassed the entire riparian area restored on Parcel 22.

For grasses and forbs, the relative abundance of each species observed was assigned a value between 1 and 6 based on the abundance categories of Simon et al. (2001). The guidelines utilized to describe the species abundance categories for grasses and forbs on Parcel 22 are presented in Table 3.1. Each species observed was noted as either included in the specified seed mix or as a volunteer. Species identified by the Indiana Department of Natural Resources (IDNR) as invasive to Southern Indiana were noted (Nice, 2006). The percent of aerial coverage of grasses and forbs within each cover type was estimated by visual inspection and recorded on the monitoring form, which is presented in Appendix B.

Monitoring of shrubs and trees consisted of identifying the species present and evaluating survival of seedlings and larger specimens planted within Parcel 22. Survival of shrubs and trees were assigned to one of four survival classes, as defined in Table 3.2. In addition to noting the survival of the specimens planted, shrubs and trees that have colonized Parcel 22 (volunteers), including invasive species, were identified and noted on the monitoring form, presented in Appendix B.

In general, the vegetative cover along the riparian corridor is dense, with aerial coverage greater than 95 percent throughout the entire parcel. There were no signs of significant erosion observed during the inspection which would require maintenance.

Grasses observed were a combination of those species in seed mixes applied to Parcel 22 and volunteer species. The majority of forbs observed were volunteer species. Some invasive forb species were observed; however, the overall percentage of invasive species in terms of both composition and aerial coverage was low. Several of the forb species in the seed mix were observed.

Trees and shrubs with diameters ranging from 0.75 to 5 inches that were planted in the area of Parcel 22 that is lawn were observed to have a survival rate greater than 76 percent (Class 4). For the remainder of Parcel 22, trees installed as seedlings were observed to have a survival rate of 51 to 75 percent (Class 3). Several of the larger trees

and all of the seedlings have been replaced since the initial plantings. The survival classes are based on the original number of trees specified in the restoration plan for Parcel 22. In addition to the species planted, one of the species observed was a volunteer (Box Elder, *Acer negundo*). No invasive species of shrubs and trees were observed.

3.3 HABITAT FEATURES

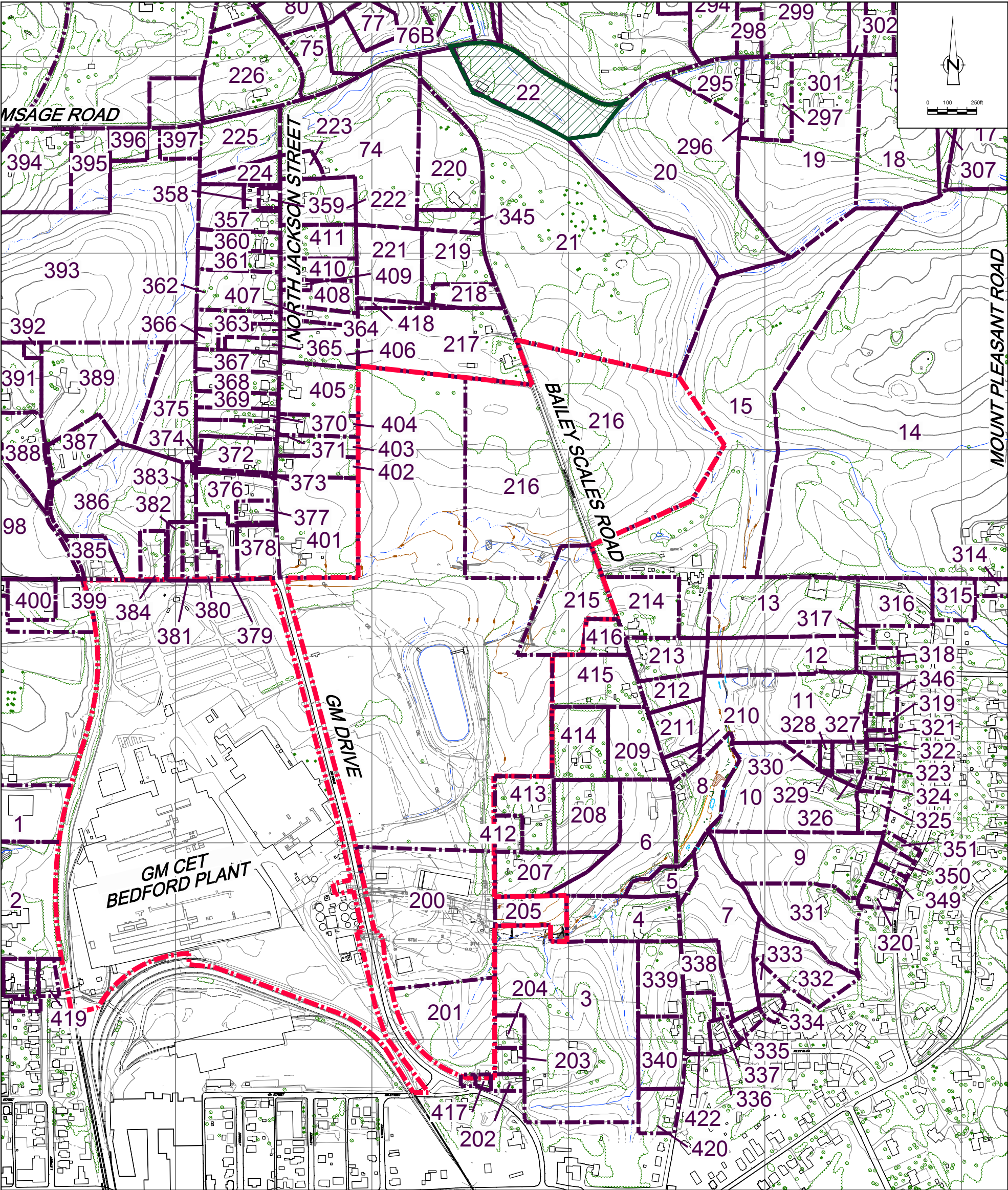
No additional enhanced habitat features other than those originally present in the creek, were incorporated into the Parcel 22 restoration. The habitat features that were installed as part of restoration still appear to be present (a diversity of substrate sizes that provide high quality habitat for benthic invertebrates, numerous riffle/pool sequences, and meanders within the bed and banks of the restored channel).

4.0 RESTORATION MAINTENANCE

Based on the observations made during the Spring 2012 inspection of Parcel 22, no maintenance activities are recommended.

5.0 REFERENCES

- Conestoga-Rovers & Associates, Inc., Parcel 22 Interim Operation, Maintenance, and Monitoring Plan, May 14, 2010.
- Nice, G. 2006. Noxious and invasion weeds and weed laws in Indiana. Purdue Extension Weed Science. Revised 12/06.
- Simon, T.P., Stewart, P.M., and Rothrock, P.E. 2001. Development of multimetric indices of biotic integrity of riverine and palustrine wetland plant communities along Southern Lake Michigan. Aquatic Ecosystem Health and Management 4: 293-309.



LEGEND

- EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
- EXISTING VEGETATION
- EXISTING BUILDINGS
- FENCE LINE
- RAILROAD TRACKS
- DIRT ROADS
- ROADS / PAVED AREAS
- APPROXIMATE SURFACE WATER LOCATION
- APPROXIMATE PARCEL BOUNDARY
- APPROXIMATE GM PROPERTY BOUNDARY
- PARCEL 22

NOTE: PARCEL 22 BOUNDARY SURVEY BY BLEDSOE RIGGERT GUERRETTAZ RECEIVED MARCH 2007. ADJACENT PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. ADJOINING PROPERTY LINES MAY NOT ACCURATELY REPRESENT THE TRUE PROPERTY BOUNDARIES.

Nº	Revision	Date	Initial

SCALE VERIFICATION	
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.	
Approved	

GM CET BEDFORD FACILITY	
2012 PARCEL 22 MONITORING REPORT	
PARCEL 22 LOCATION	

CONESTOGA-ROVERS & ASSOCIATES			
Source Reference: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI. APRIL 2001 AND CRA SURVEYS 2002 TO 2005			
Project Manager: J.M.	Reviewed By: P.G.	Date: JANUARY 2011	
Scale: AS SHOWN	Project Nº: 17368-20	Report Nº: 007	Drawing Nº: figure 1.1

TABLE 2.1

**TREE/VEGETATION SUMMARY
2012 PARCEL 22 MONITORING REPORT
GM CET BEDFORD FACILITY
BEDFORD, INDIANA**

	<i>Number of trees/seedlings and shrubs installed</i>	<i>Other</i>
Parcel 22	66	grass/wildflower seed mix, slope forest seed mix, lawn seed mix and sod

TABLE 3.1

SPECIES ABUNDANCE CATEGORIES FOR GRASSES AND FORBS
 2012 PARCEL 22 MONITORING REPORT
 GM CET BEDFORD FACILITY
 BEDFORD, INDIANA

<i>Abundance Rating</i>	<i>Abundance Category</i>	<i>Description</i>
1	Observed	1 individual of a species present
2	Rare	2-4 individuals of a species present
3	Rare/Common	>4 individuals of a species, but not enough to be categorized as "common"
4	Common	Species is easily located
5	Very Common	Species is slightly dominant; up to 25% of the plant community
6	Abundant	Species accounts for 25-100% of the plant community

Source: Simon et al., 2001

TABLE 3.2

SURVIVAL CLASSES FOR TREES AND SHRUBS
2012 PARCEL 22 MONITORING REPORT
GM CET BEDFORD FACILITY
BEDFORD, INDIANA

<i>Survival Class</i>	<i>Range of Percent Survival</i>
1	0 – 25%
2	26 – 50%
3	51 – 75%
4	76 – 100%

APPENDIX A

SPRING 2012 CREEK CHANNEL PHOTOGRAPHIC LOG

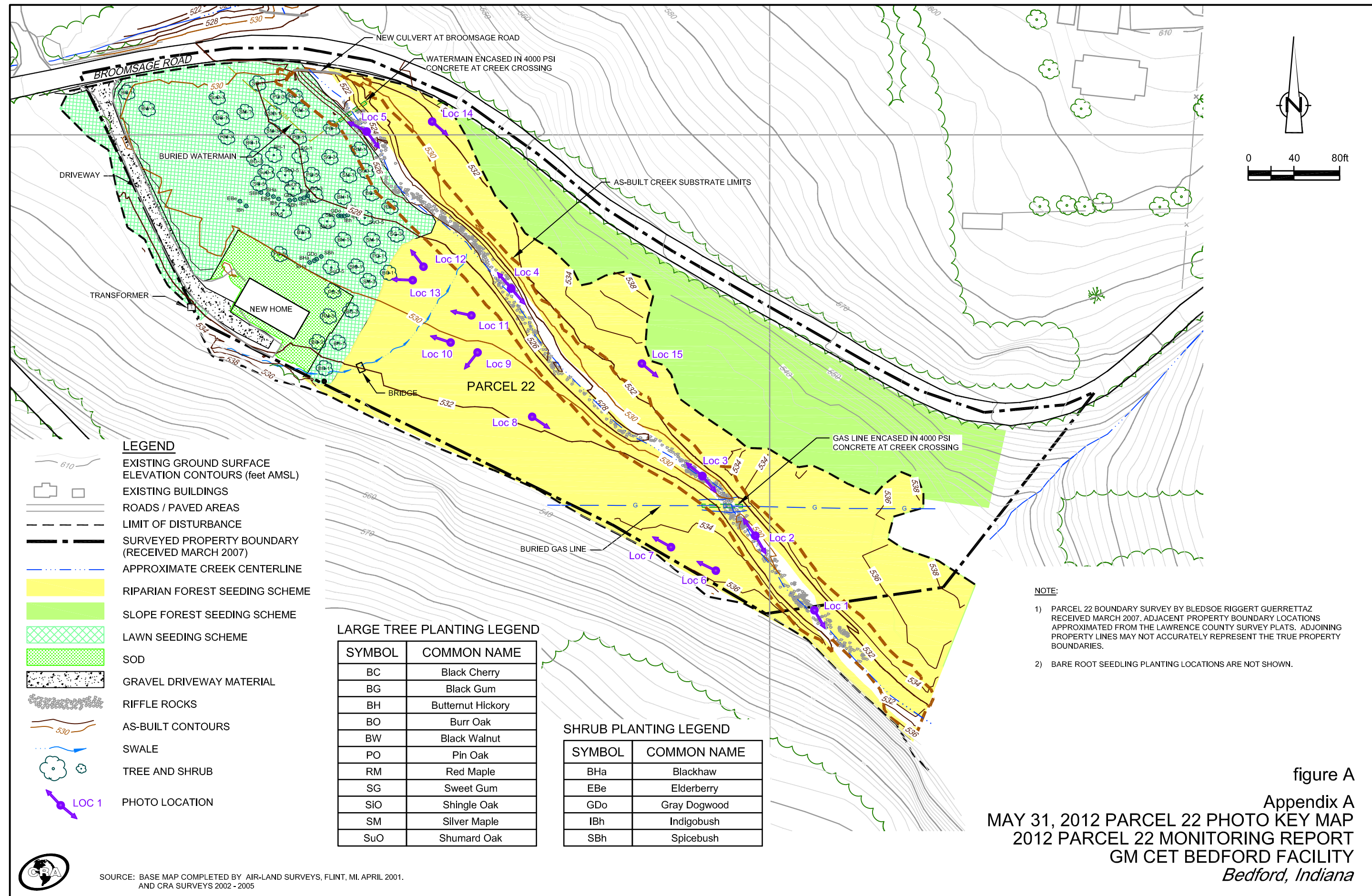


figure A
Appendix A
MAY 31, 2012 PARCEL 22 PHOTO KEY MAP
2012 PARCEL 22 MONITORING REPORT
GM CET BEDFORD FACILITY
Bedford, Indiana



PHOTO 1: LOCATION 1 - LOOKING SOUTHEAST (UPSTREAM)

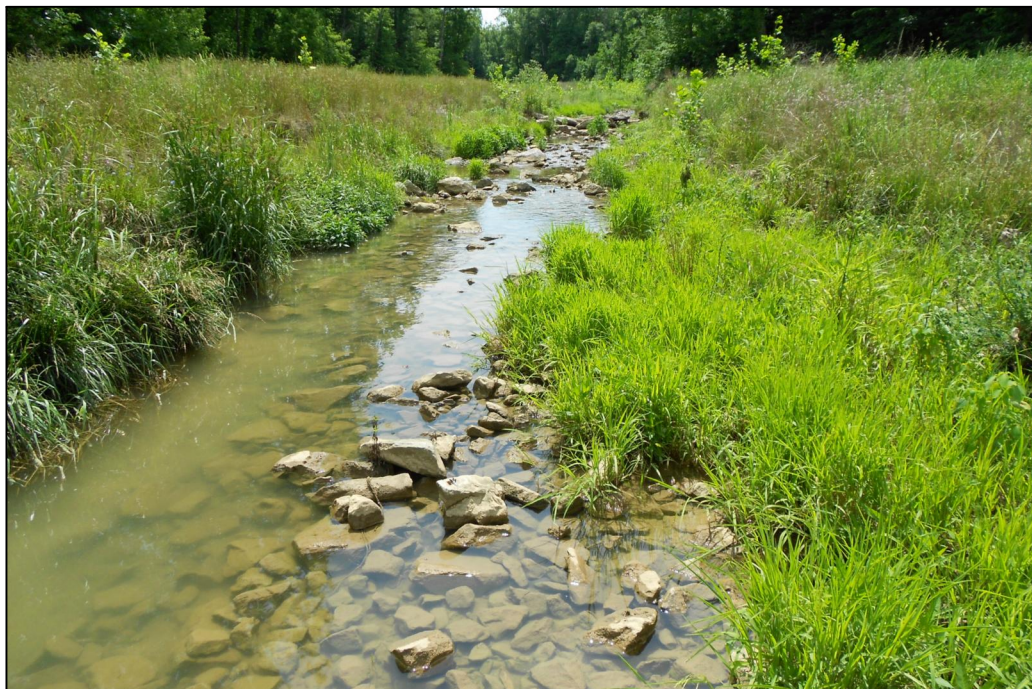


PHOTO 2: LOCATION 2 - LOOKING SOUTHEAST (UPSTREAM)

Appendix A

MAY 31, 2012 PARCEL 22 PHOTO LOG
 2012 PARCEL 22 MONITORING REPORT
 GM CET BEDFORD FACILITY
Bedford, Indiana





PHOTO 3: LOCATION 2 - LOOKING NORTHWEST (DOWNSTREAM)

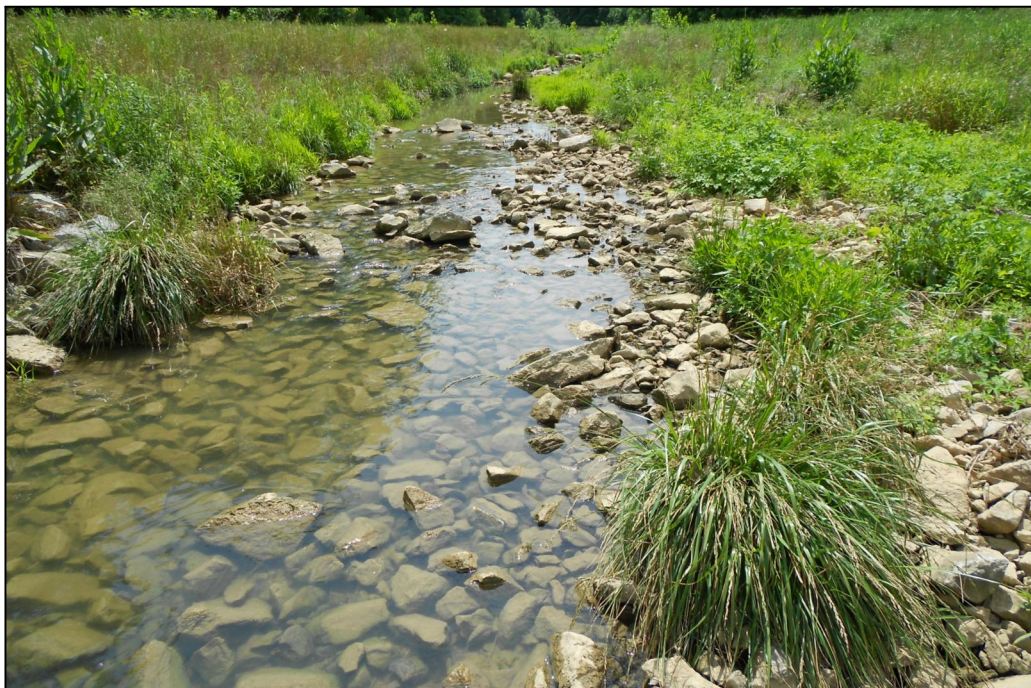


PHOTO 4: LOCATION 3 - LOOKING SOUTHEAST (UPSTREAM)

Appendix A

MAY 31, 2012 PARCEL 22 PHOTO LOG
 2012 PARCEL 22 MONITORING REPORT
 GM CET BEDFORD FACILITY
Bedford, Indiana





PHOTO 5: LOCATION 3 - LOOKING NORTHWEST (DOWNSTREAM)



PHOTO 6: LOCATION 4 - LOOKING SOUTHEAST (UPSTREAM).

Appendix A

MAY 31, 2012 PARCEL 22 PHOTO LOG
 2012 PARCEL 22 MONITORING REPORT
 GM CET BEDFORD FACILITY
Bedford, Indiana





PHOTO 7: LOCATION 4 - LOOKING NORTHWEST (DOWNSTREAM)



PHOTO 8: LOCATION 5 - LOOKING SOUTHEAST (UPSTREAM)

Appendix A

MAY 31, 2012 PARCEL 22 PHOTO LOG
 2012 PARCEL 22 MONITORING REPORT
 GM CET BEDFORD FACILITY
Bedford, Indiana





PHOTO 9: LOCATION 5 - LOOKING NORTHWEST (DOWNSTREAM)



PHOTO 10: LOCATION 6 - LOOKING NORTHWEST

Appendix A

MAY 31, 2012 PARCEL 22 PHOTO LOG
 2012 PARCEL 22 MONITORING REPORT
 GM CET BEDFORD FACILITY
Bedford, Indiana





PHOTO 11: LOCATION 7 - LOOKING NORTHWEST



PHOTO 12: LOCATION 8 - LOOKING SOUTHEAST

Appendix A

MAY 31, 2012 PARCEL 22 PHOTO LOG
2012 PARCEL 22 MONITORING REPORT
GM CET BEDFORD FACILITY
Bedford, Indiana





PHOTO 13: LOCATION 9 - LOOKING SOUTHWEST



PHOTO 14: LOCATION 10 - LOOKING NORTHWEST

Appendix A

MAY 31, 2012 PARCEL 22 PHOTO LOG
2012 PARCEL 22 MONITORING REPORT
GM CET BEDFORD FACILITY
Bedford, Indiana





PHOTO 15: LOCATION 11 - LOOKING NORTHWEST



PHOTO 16: LOCATION 12 - LOOKING NORTHWEST

Appendix A

MAY 31, 2012 PARCEL 22 PHOTO LOG
 2012 PARCEL 22 MONITORING REPORT
 GM CET BEDFORD FACILITY
Bedford, Indiana





PHOTO 17: LOCATION 13 - LOOKING WEST



PHOTO 18: LOCATION 14 - LOOKING SOUTHEAST

Appendix A

MAY 31, 2012 PARCEL 22 PHOTO LOG
2012 PARCEL 22 MONITORING REPORT
GM CET BEDFORD FACILITY
Bedford, Indiana





PHOTO 19: LOCATION 15 - LOOKING SOUTHEAST

Appendix A

MAY 31, 2012 PARCEL 22 PHOTO LOG
2012 PARCEL 22 MONITORING REPORT
GM CET BEDFORD FACILITY
Bedford, Indiana



APPENDIX B

SPRING 2012 VEGETATIVE ASSESSMENT FIELD FORMS

VEGETATION MONITORING FORM
UPSTREAM PARCELS IOMMP
GM CET BEDFORD FACILITY
BEDFORD, INDIANA

Inspectors	S. Jones
Date	May 31, 2012
Parcels/Cover Type	Parcel 22/Grass-Forb Cover

I. GRASSES AND FORBS

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Swithgrass	<i>Panicum virgatum</i>	3	Rare/Common	X			X		X
Redtop	<i>Agrostis sp.</i>	5	Very Common	X			X		X
Foxtail	<i>Alopecurus sp.</i>	5	Very Common		X	X			X
Tall Fescue	<i>Schedonorus phoenix</i>	3	Rare/Common		X	X			X
Kentucky Bluegrass	<i>Poa pratensis</i>	3	Rare/Common	X			X		X
Sideoats Gramma	<i>Bouteloua curtipendula</i>	2	Rare		X	X			X
Orchardgrass	<i>Dactylis glomerata</i>	3	Rare/Common		X	X			X
Unidentified Grass	<i>Gramineae</i>	3	Rare/Common		X	X			---
Bird's-Foot Trefoil	<i>Lotus unifoliolatus</i>	2	Rare		X	X			X
Daisy Fleabane	<i>Erigeron annuus</i>	3	Rare/Common	X			X		X
Giant Ragweed	<i>Ambrosia trifida</i>	4	Common		X	X			X
Queen Anne's Lace	<i>Daucus carota</i>	2	Rare		X	X			X

VEGETATION MONITORING FORM
UPSTREAM PARCELS IOMMP
GM CET BEDFORD FACILITY
BEDFORD, INDIANA

I. GRASSES AND FORBS (continued)

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Sweetclover	<i>Melilotus officinalis</i>	3	Rare/Common		X	X		X	
Ragweed	<i>Ambroia artemisiifolia</i>	4	Common		X	X			X
Lurid Sedge	<i>Carex lurida</i>	3	Rare/Common		X	X			X
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	2	Rare		X	X			X
Vetch	<i>Vica sp.</i>	4	Common		X	X			X
Canada Goldenrod	<i>Solidago canadensis</i>	4	Common		X	X			X
Common Plantain	<i>Plantago major</i>	2	Rare		X	X			X
Canada Thistle	<i>Cirsium arvense</i>	3	Rare/Common		X	X		X	
Common Dandelion	<i>Taxacum officinale</i>	1	Observed		X	X			X
Peppermint	<i>Mentha sp.</i>	2	Rare		X	X			X
Teasel	<i>Dipsacus sp.</i>	3	Rare/Common		X	X		X	
Common Mullein	<i>Verbascum thapsus</i>	2	Rare		X	X			X
Sowthistle	<i>Sonchus sp.</i>	3	Rare/Common		X	X			X
Aster	<i>Aster sp.</i>	4	Common	X			X		X
Red Clover	<i>Trifolium pratense</i>	4	Common		X	X			X
White Clover	<i>Trifolium repens</i>	3	Rare/Common		X	X			X

Percent Areal Coverage of Grasses and Forbs

VEGETATION MONITORING FORM
UPSTREAM PARCELS IOMMP
GM CET BEDFORD FACILITY
BEDFORD, INDIANA

I. GRASSES AND FORBS (continued)

Common Name	Scientific Name	Abundance		Seeded		Volunteer		Invasive	
		Rating	Category	Yes	No	Yes	No	Yes	No
Curly Dock	<i>Rumex crispus</i>	4	Common		X	X			X
Chicory	<i>Chicorium intybus</i>	1	Observed		X	X			X
Golden Ragwort	<i>Packera aurea</i>	1	Observed		X	X			X
Bulrush	<i>Schoenoplectus sp.</i>	1	Observed		X	X			X
Common Groundsel	<i>Packera sp.</i>	2	Rare		X	X			X
Blackeyed Susan	<i>Rudbeckia hirta</i>	1	Observed		X	X			X

Percent Areal Coverage of Grasses and Forbs

>95%

VEGETATION MONITORING FORM
UPSTREAM PARCELS IOMMP
GM CET BEDFORD FACILITY
BEDFORD, INDIANA

II. SHRUBS AND TREES

Common Name	Scientific Name	Planted		Volunteer		Invasive	
		Yes	No	Yes	No	Yes	No
Red Maple	<i>Acer rubrum</i>	X			X		X
Bur Oak	<i>Quercus macrocarpa</i>	X			X		X
Sycamore	<i>Platanus occidentalis</i>	X			X		X
Box Elder	<i>Acer negundo</i>		X	X			X
Black Gum	<i>Nyssa sylvatica</i>	X			X		X
Sweet Gum	<i>Liquidambar styraciflua</i>	X			X		X
Shumard Oak	<i>Quercus shumardii</i>	X			X		X
Hickory	<i>Carya sp.</i>	X			X		X
Silver Maple	<i>Acer saccharinum</i>	X			X		X

Survival Class

≤ 25%

26-50%

51-75%**> 75%****Shrubs and Trees**Restored
Natural Area

Lawn

III. WILDLIFE OBSERVED

Numerous songbirds, Crows, Red-Tailed Hawk

Dead Raccoon by side of stream near road

Numerous species of dragonflies

¹ - Invasive species based on: Nice, G. 2006. Noxious and Invasive Weeds and the Weed Laws in Indiana. Purdue Extension Weed Science. Revised 12/06