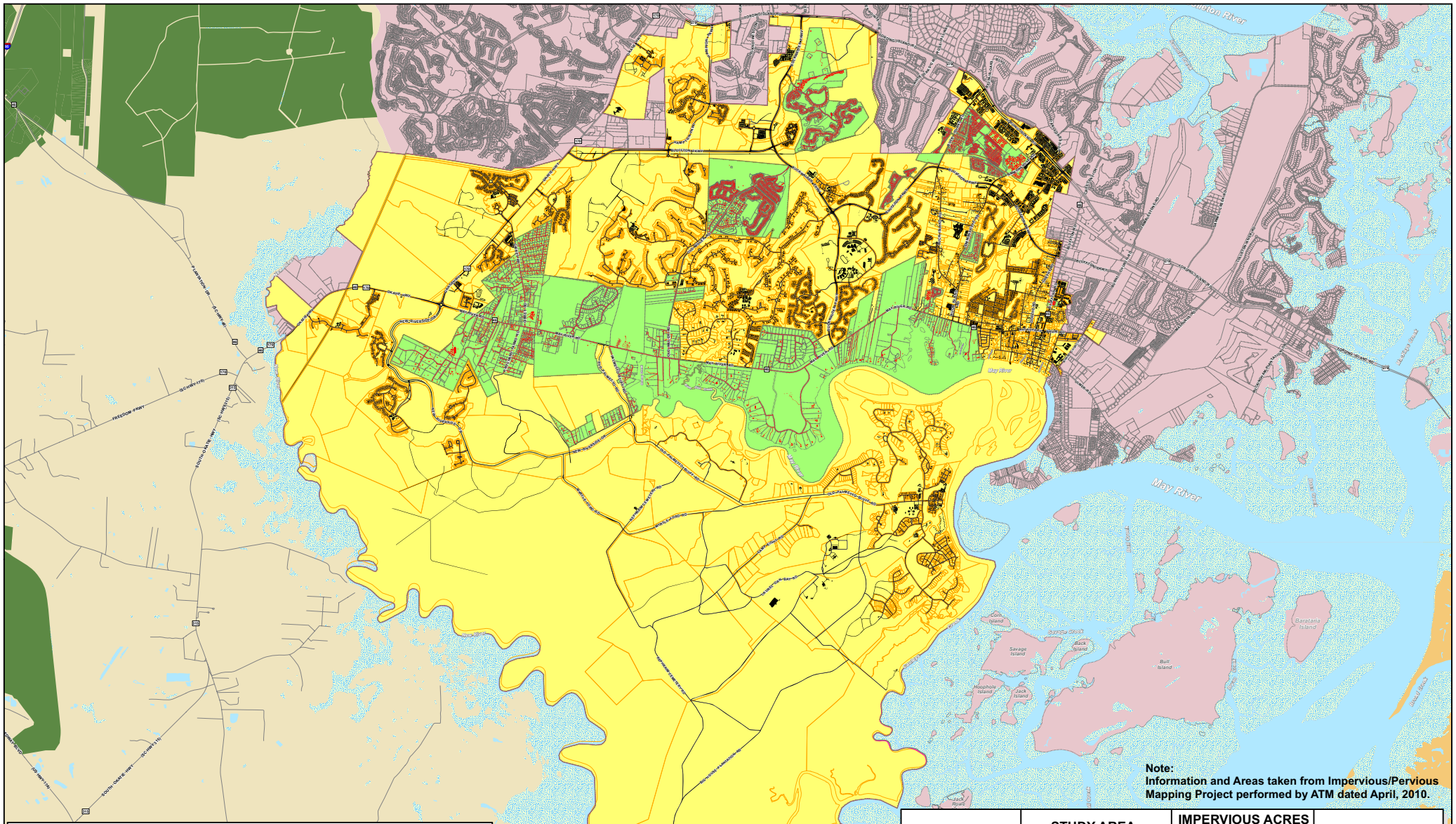
MAY RIVER WATERSHED ACTION PLAN

APPENDIX A:

IMPERVIOUS / PERVIOUS STUDY



Note:
Information and Areas taken from Impervious/Pervious Mapping Project performed by ATM dated April, 2010.

LEGEND

- Study Area Boundary
- Town Impervious within Study Area
- County Impervious within Study Area
- Town Jurisdiction of Study Area
- County Jurisdiction of Study Area
- Road
- Town Boundary Line
- Bluffton Parcels
- Beaufort County Parcels
- Jasper County
- Hardeeville Town Limits
- Water
- Marsh

	STUDY AREA ACRES	IMPERVIOUS ACRES WITHIN STUDY AREA	IMPERVIOUS %
WITHIN TOWN	34,457	1,531	4.4%
WITHIN COUNTY	5,503	444	8.1%
TOTAL	39,960	1,975	4.9%

north

DISCLAIMER:
This map was created by the GIS Office of the Town of Bluffton's Information Technology Division and is solely intended to be used as a graphical representation for the Town of Bluffton. The GIS maps and data distributed by the GIS Office of the Town of Bluffton's Information Technology Division are derived from a variety of public and private sector sources considered to be dependable, but the accuracy, completeness and currency thereof are not guaranteed. The Town of Bluffton makes no warranties, expressed or implied, as to the accuracy, completeness, currency, reliability, or suitability for any particular purpose of information or data contained in or generated from the town's Geographic Information Systems database. Additionally, the Town of Bluffton or any agent, servant, or employee thereof assume no liability associated with the use of this data, and assume no responsibility to maintain it in any matter or form.

Map Printed:
May 13, 2010

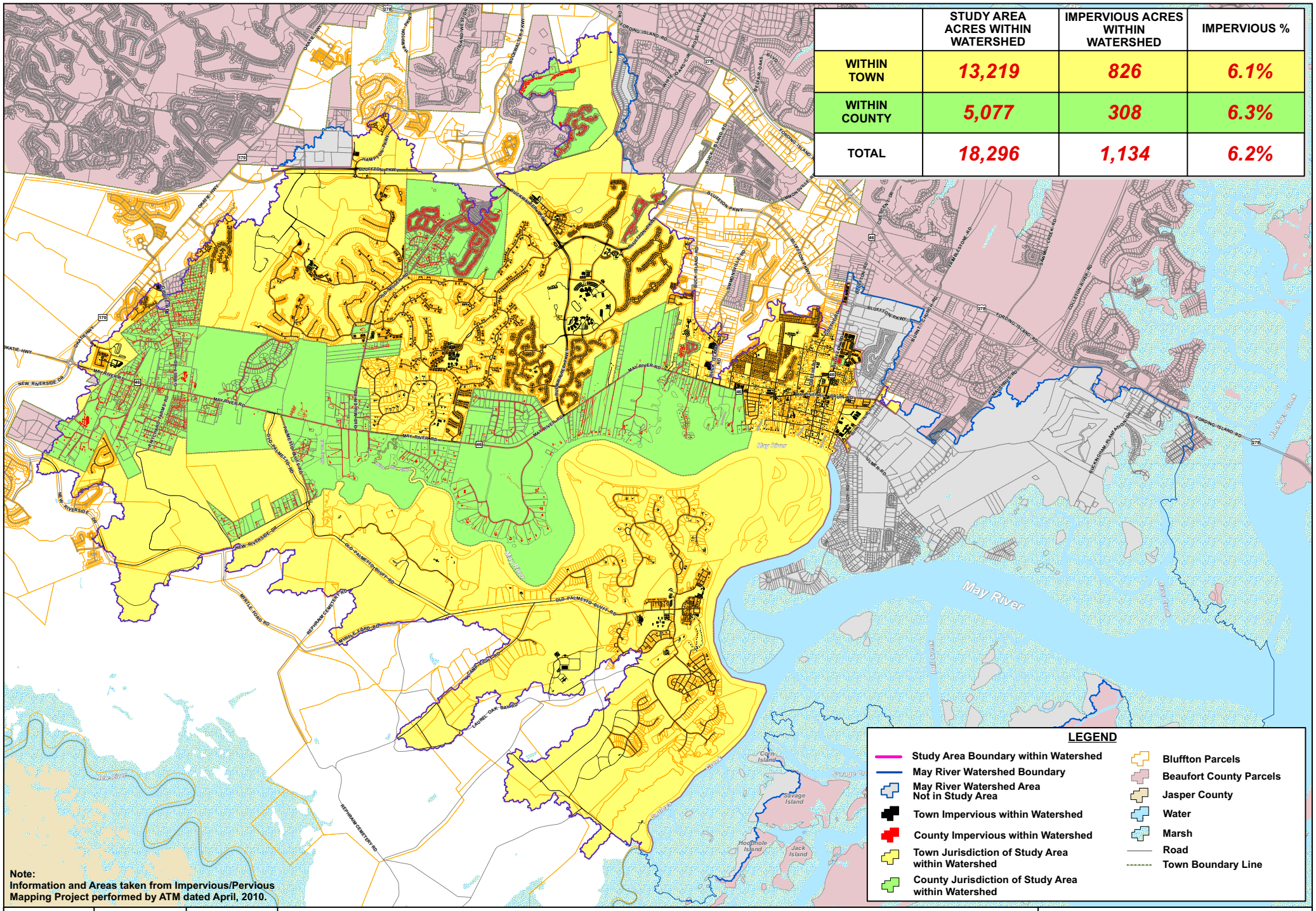
IMPERVIOUS COVER WITHIN THE STUDY AREA

Town of Bluffton · Beaufort County, SC

PLANNING & ENVIRONMENTAL SUSTAINABILITY OFFICE

0 1,500 3,000 6,000 9,000 12,000
SCALE IN FEET 1:25,000 1"= 2083'

	STUDY AREA ACRES WITHIN WATERSHED	IMPERVIOUS ACRES WITHIN WATERSHED	IMPERVIOUS %
WITHIN TOWN	13,219	826	6.1%
WITHIN COUNTY	5,077	308	6.3%
TOTAL	18,296	1,134	6.2%



Note:
Information and Areas taken from Impervious/Pervious Mapping Project performed by ATM dated April, 2010.

north

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Map Printed:
May 13, 2010

IMPERVIOUS COVER WITHIN THE MAY RIVER WATERSHED

Town of Bluffton · Beaufort County, SC

PLANNING & ENVIRONMENTAL SUSTAINABILITY OFFICE

0 1,250 2,500 5,000 7,500 10,000
SCALE IN FEET 1:18,000 1"= 1500'

MEMORANDUM

To: **John Carmack, Town of Bluffton**

From: **Chris Ahern**

Cc: **Carl Norris, Town of Bluffton**
Tony Maglione, ATM
Kayle Moore, ATM

Date: **10 June 2010** (Revision 2 of 15 April 2010 original version and 13 May 2010 Revision 1)

Project: Town of Bluffton Impervious Mapping Project

Subject: Technical Memorandum accompanying FINAL Deliverables on 21 April 2010

The purpose of this Memorandum is to describe the methodology and assumptions made to prepare the FINAL deliverables for the Impervious Coverage provided to the Town of Bluffton. The FINAL *.shp files were delivered on a DVD delivered to your office Thursday 15 April 2010. The FINAL 34" by 42" and the 11" by 17" booklets will be delivered to your office Wednesday 21 April 2010.

The calculated impervious area from this project is summarized on page 3 of this Memorandum.

We appreciate the opportunity to work for the Town of Bluffton and look forward to support any future need the Town may have.

Methodology

Impervious features were digitized from 2009 natural color orthographic imagery provided by Beaufort County, using AutoCAD Civil 3d 2009 and ArcView 9.3. The Feature data digitized in CAD was imported into an ArcView GIS feature dataset and cleaned to remove overshoots and "sliver" polygons. All GIS feature datasets created for this project are in the NAD 1983 StatePlane South Carolina FIPS 3900 (Feet) coordinate system.

The digitized features were assigned to be one of 5 attributes.

Attribute	Description of items in Feature
BUILDING	main residential or commercial structure (s) on property
EXTRA STRUCTURE	ancillary structure apparent on imagery (shed/garage, pool/patio, gazebo, etc.)
DRIVEWAY	concrete, paved or otherwise improved vehicle driveways on properties
PARKING LOTS	concrete, paved or otherwise improved parking areas on properties
DRIVEWAYS/PARKING	combination parking areas with extended access driveways

Heavy tree cover obscured some features on properties and these features could not be confidently digitized. GIS points were created for these features or possible features at the approximate feature locations. The Unclear Features points were reviewed in GIS during the Quality Control process for this project using the imagery and a polygon shapefile of building footprints prepared by the County and provided by the Town. Building footprints at Unclear Feature points, or on the parcel containing the point, were copied to the Impervious Feature layer and attributed with the Source "2007 TOB ftprnt." Most of these features were assumed to be BUILDINGS, but if cases where it was impossible to discern a feature type, the attribute value "UNKNOWN" was used.

All Unclear Feature points for which County building footprints were copied were attributed with the Comment "Copied shape(s) from County footprint layer." If no building footprint was present at or near the point, the Unclear Point Feature was attributed with the Comment "No County footprint available."

In some cases, heavy shadows on the imagery prevented the digitizer from determining if extra impervious features were present, particularly patios in residential subdivisions. In these instances, a typical EXRA STRUCTURE feature was added if it appeared that all or most to the houses in that area or subdivision included such a feature.

The impervious area for roadways was primarily developed by creating buffer polygons at a standard offset of 12 feet from the road centerlines provided in the Town of Bluffton Streets GIS layer. Some roadways were apparent on the imagery but were not included in the Town's GIS layer. These roadway surfaces were digitized from the imagery and attributed with the Source "2009 Orthos." Several smaller road in the southern portion of the project area were not included in the Town's GIS layer but were available from the USGS TIGER GIS data. Polygon buffers were created from these centerlines and added to the Impervious Features layer with the Source "TIGER roads." Some roadways created from the Bluffton streets layer did not appear on the imagery; these roadways were NOT removed during the QC process in case they represent new existing roads.

As agreed in the 22 March 2010 Meeting to discuss the pilot study results, several major intersections were digitized to account for collector and merge lanes and islands. Circular areas or "donuts" were also added at all cul-de-sacs with these features shown in the imagery. Although beyond the scope of this project, many (but not all) smaller intersections and cul-de-sacs within subdivisions were "cleaned" to better match the imagery during the data QA/QC process.

Mr. John Carmack
10 June 2010 (Revision 2)

Summary of Results

Feature	**Feature Count (Quantity)**
Buildings	7,683
Driveways	6,517
Extra Structures	4,057
Parking Lots	240
Driveway/Parking	20
Unknown	96
Roadways	955 *≈ 41 features digitized from 2009 ortho imagery* *≈ 19 features using offset from TIGER road shapefile* *≈ 895 features using offset from Bluffton street shapefile and adjusted at major intersections and within some subdivisions*

Town of Bluffton Only:

Impervious	**1,531 ac**	**4.4 %**
Pervious	**32,926 ac**	**95.6 %**
Total	**34,457 ac**	**100.00 %**

Unincorporated Areas Only:

Impervious	**444 ac**	**8.1 %**
Pervious	**5,059 ac**	**91.9 %**
Total	**5,503 ac**	**100.00 %**

Project Study Area (Town of Bluffton and Unincorporated Areas):

Impervious	**1,975 ac**	**4.9 %**
Pervious	**37,985 ac**	**96.1 %**
Total	**39,960 ac**	**100.00 %**

Notes regarding uses and updates of the GIS Deliverables *(Notes 2 through 8 are provided on page 4 of 4)*

1. Sidewalks are not included in this impervious calculation as agreed during the 22 March 2010 Meeting regarding the pilot study results. The Town of Bluffton can add to the Impervious Features dataset by digitizing, buffered offsets form road centerlines, GPS data collection or some combination of suitable methods. ATM has provided the Town of Bluffton a proposal to include this additional area in the impervious database.

Notes regarding uses and updates of the GIS Deliverables *(Continued from Page 3 of 4)*

2. Heavy tree cover obscured some features on properties and these features could not be confidently digitized. GIS points were created for these features or possible features at the approximate feature locations. The Unclear Features points were reviewed in GIS during the Quality Control process for this project using the imagery and a polygon shapefile of building footprints prepared by the County and provided by the Town. Building footprints at Unclear Feature points, or on the parcel containing the point, were copied to the Impervious Feature layer and attributed with the Source "2007 TOB ftprnt." Most of these features were assumed to be BUILDINGS, but if cases where it was impossible to discern a feature type, the attribute value "UNKNOWN" was used. ATM recommends the Town consider researching building permits or obtain measurement from field visits in order to confirm the assumptions made to prepare the deliverables for this project.

3. In some cases, Heavy shadows on the imagery prevented the digitizer from determining if extra impervious features were attached to structures but obscured by the shadows, particularly patios in residential subdivisions. In these instances, a typical EXRA STRUCTURE feature was added if it appeared that all or most to the houses in that area or subdivision included such a feature. ATM recommends the Town consider researching building permits or obtain measurement from field visits in order to confirm the assumptions made to prepare the deliverables for this project.

4. Roadways in the Town of Bluffton layer occasionally noted a roadway that was not shown in the corresponding 2009 imagery. Where the Town streets layer noted a street however no street could be observed in aerials, these areas WERE NOT removed from the existing roadway layer and thus the impervious area calculation. The digitizer assumes the roadway layer provided by the Town is more current than the 2009 aerials and the roadway may now exist. No separate layer was used to denote where the roadway layer was different from the 2009 aerials.

5. Roadway Features which are either considerably narrower or wider than the standard offset using for this project should be revised either using measured offsets or digitizing the edge of pavement from the imagery.

6. ATM corrected most of the errors resulting from a standard offset being applied however recommends the Town review smaller intersections (e.g, intersections of two lane roads) which may not have been adjusted for this deliverable project. Specifically, the Town should review standard offsets and adjust the polygon coverage to the actual aprons and turn radii.

7. Roadway, driveway and parking lot features developed in this project are all assumed to be impervious. The Town may wish to expand on the information for these features by determining and differentiating surface types (i.e. paved, shell, dirt).

8. It should be noted that some spatial inconsistencies among the imagery were observed using the street layer and parcel base data used for this project. The data created for this project should be used to determine impervious/pervious characteristics for larger spatial areas within the town such as subdivision or land use regions. Site specific use of this dataset should include a review by Town staff to verify acceptable accuracy for the intended use.