STORMWATER UTILITY UPDATE

FINAL REPORT

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Emmons and Olivier Resources, Inc.
651 Hale Avenue North
Oakdale, MN 55082

Tel: 651-770-8448

www.eorinc.com

1. Background and Overview

A stormwater utility provides a means to collect funds based on the amount of impervious and associated runoff contributed to the drainage system. As the South Washington Watershed District (SWWD) completed the process of expanding to include the East Mississippi River Watershed Management Organization during 2002 and 2003, the need to develop a method of funding on a subwatershed basis was identified. A stormwater utility, in conjunction with existing policies developed within the SWWD Watershed Management Plan, will provide the necessary tools to develop a funding mechanism based on contributing subwatersheds.

The SWWD Stormwater Utility project was first initiated in 1999. Preliminary work has been completed by Bonestroo Rosene Anderlik and Associates (BRAA) including calculating Residential Equivalent Factors (REF) for the majority of parcels within the existing SWWD as of 1999. A draft report was presented to the District Administrator on 6-5-00 for review. A copy of this report is found in Appendix A. EOR has updated the work by BRAA to include new parcels added to the SWWD and parcels that have been developed since 1999.

2. Data Collection

Data used in the creation of the updated Utility were derived from a variety of different sources. Attribute data developed by BRAA as part of the 1999 project were used as the basis for the update. Additional data used in the utility update were provide by Washington County (Parcel Databases dated 4-30-03, 7-31-03, and 12-31-03), individual municipalities and through aerial photo interpretation.

Three datasets were used in the analysis, as provided by Washington County, and include:

1. Washington County Parcel Database, provided by Washington County Survey and Land Management Division;
2. Washington County Condo Code Database, provided by Washington County Survey and Land Management Division; and
3. Washington County Assessor's Database, provided by Washington County Department of Assessment, Taxpayer Services and Elections.

All parcels were classified into land use categories based on the Washington County Assessors Database including single family residential (SFR), agricultural, commercial/industrial, institutional, multifamily residential, condominiums, vacant, common, roads, government, and. Appendix B contains the list of Washington County land use codes and their equivalent SWWD land use code. Definitions are as follow:

- Single family residential contains all single family residential parcels, town homes that are identified as individually owned in the County database, and church residences;
- Agricultural contains all agricultural production land and farmsteads;
- Commercial/industrial contains commercial and industrial properties;
- Institutional contains schools, churches, cemeteries, hospitals, and nonprofit organizations;
- Multifamily residential contains apartment complexes and town homes that are not individually owned;
- Condo contains town homes that are individually owned but not represented in the County database as individually owned;
- Vacant contains parcels classified as institutional, commercial, multifamily, industrial, and government that were vacant at the time of this project and outlots that were identified as being vacant;
- Common contains parcels that are located in a common area of a multifamily residential unit. Commons areas occur with condo, twin home, row house or multifamily residential dwelling and typically consist of parking lots and private drives;
- Road contains parcels that did not have an owner identified in the database and were determined to be roadways;
- Government contains parcels that are owned by the State of Minnesota, Washington County, or Cities including City halls, parks and open space, libraries, and public roads.

Impervious surfaces were determined for each of the commercial/industrial, multifamily residential, government, and institutional parcels based on existing data. Sources of the impervious data are displayed in Figure 1.

2-1. Identified Problems

Several discrepancies were encountered within the Washington County Assessor's Database. Specifically, government owned parcels were often classified in the assessor's database with private land use codes such as residential or commercial. All of the parcels within the database were sorted by owner and those that were identified as being owned by the State of Minnesota, Washington County, or member cities were hand classified as Government, regardless of the County land use code. In addition, the land use codes for various parcels were inaccurate in the County database. This required hand checking the land use of each parcel and adjusting the database as needed.

Recommendation:
Washington County to provide accurate land use codes for each parcel based on Assessor's Database and available County information.

Several parcels within the Washington County Parcel Database did not contain valid Geocodes. These sites were condominiums or town homes that were individually owned, but appeared as a single parcel within the database. These sites were hand selected and additional information was obtained from Washington County to break down the given parcel Geocodes into Condo Codes. A database file is included with the final report containing the Condo Codes and relevant Geocodes.

Recommendation:
Include all Condo properties in Parcel Database by splitting existing parcels which contain a number of privately owned condos and assigning each condo unit its 13 digit geocode.

Duplicate Geocodes were another discrepancy encountered when working with the Washington County Parcel Database. In several locations two parcels of land contained identical geocode numbers. This presented a problem when linking in external table data to the parcel data set and then calculating values for parcels. Duplicate parcels not only presented a problem when processing, but were also not accepted by the Washington County tax system. Further processing and checking was required to ensure accurate values on all parcels that contained duplicate Geocodes.

Recommendation:
Modify Parcel Database to contain one Geocode per polygon by unioning duplicate polygons to create one attribute record per Geocode.

The existence of a 6 month lag time between the Parcel Database used to certify the stormwater utility budget to Washington County and the final assignment of charges to parcel Geocodes creates a number of invalid, or nonexistent, Geocodes. This is due to development within the watershed. Typically, an agricultural property with a unique Geocode is developed into a number of SFR units, all with unique Geocodes that did not exist at the time of the budget certification. It is unclear the steps that are allowed to collect the funds associated with these invalid Geocodes and associated parcels.

Recommendation:
Work with Washington County to identify steps to solve 6 month lag time problems.
Identify what specifically is being certified in September - parcels (land descriptions), total budget or dollar amount charged per REU?

3. Residential Equivalency Units Analysis

The method used to determine a Residential Equivalency Factor (REF) is described in detail within the BRAA report dated 6-5-00 (see Appendix A, page 5). A REF provides a basis on which to build the Stormwater Utility. One REF is designated based on the typical single family residential parcel and its associated imperviousness. A Residential Equivalency Unit (REU) is the number of or fraction of an REF that is assigned to each parcel in the watershed.

The method of assigning REUs differs here from that proposed within the BRAA 1999 project in that the revised methodology assigns REUs to agricultural, government and vacant properties. The methodology presented here was developed by EOR staff in conjunction with the District Administrator and SWWD Board of Managers.

Single family residential (SFR) parcels are assigned a single REU, not dependant on size of parcel. As part of the 1999 study, approximately 100 parcels were used to develop an average single family residential lot and imperviousness. The 2004 update field checked 10 homes typical of new construction to verify the average lot size and imperviousness. Dancing Waters and Stone Mill Farms developments in Woodbury were used for this analysis. Results of the field verification indicate that new construction is creating a greater percent impervious per lot then assumed during the 1999 Study. There are a limited number of constructed homes that are characteristic of this new imperviousness and therefore the equivalent REF was not changed. It is recommended that the SFR impervious and REF be revisited after Woodbury completes Phase I of its future development. Figure 2 illustrates typical SFR parcels within the watershed.

All agricultural lands and vacant properties were assigned 1 REU. This value was not dependent on the size of the parcel. Figure 3 illustrates a typical agricultural property.

Commercial, industrial, institutional, government, and multifamily residential (apartment buildings) were assigned REUs based on the percent impervious and the size of the parcel. Values for the percent impervious were obtained from cities, digitized from 2000 aerial photographs, or calculated from grading and as-built plans. The percent impervious was converted to an equivalent REF per acre and then multiplied by the acreage of the parcel to obtain the assigned REU value. Figures 4-7 illustrate typical examples of these properties.

Public roads and identified drainage systems including ponds were not assigned any REUs.

4. Results

Table 1 summarizes the number and distribution of REUs in the watershed based on parcel data dated 7-31-03. These data were used to provide the final levy certification to Washington County.

Table 1. SWWD Residential Equivalent Units

Landuse	Total Parcels	Total REUs
Single Family Residential	22,063	22,063.0
Commercial, Industrial	636	9,567.9
Institutional	69	2,002.4
Multifamily Residential	228	1,189.2
Twin Home, Town Home, Row House	2,622	1,966.5
Agricultural	481	481
Government	190	2,094.6
Condo	258	1,499.5
Vacant	632	632
Road, Pond	1,292	0.0
Total	**28,471**	**41,496**

Table 2 contains a breakdown of REUs within each City. Also included in Table 2 is a summary of the REUs within the Central Draw project area.

Table 2. Breakdown of REUs

	Number of REUs		
	Commercial, Industrial, Multifamily Residential, Institutional	**Single Family Residential, Condo, Agricultural, Vacant**	**Total REUs**
Oakdale	547.5	440.3	987.8
Lake Elmo	324.7	26.0	350.7
Woodbury	6,255.1	10,582.5	16,837.6
Afton	0.0	10.0	10.0
Newport	1,454.7	1,348.0	2,802.7
Cottage Grove	6,731.8	10,091.5	16,823.3
St. Paul Park	1,502.2	1,938.0	3,440.2
Grey Cloud Island Township	4.7	239	243.7
Total Watershed	**16,820.7**	**24,675.3**	**41,496.0**
Within EMRWMO Subwatershed	3,010.3	3,925.3	6,935.6
Within 75% Project Area Subwatershed	7,125.2	10,563.8	17,688.9
Within City of Woodbury and 75% Project Area Subwatershed	6,203.0	10,046.5	16,249.5

5. Verification

After preliminary processing was completed a database file containing Geocodes and their associated charges were submitted to Washington County. Geocodes and associated stormwater utility charges were uploaded into the tax system. Not all Geocodes uploaded successfully into the tax system. Parcels rejected by the tax system were classified as invalid or duplicate and were looked at on a parcel by parcel basis to insure an accurate charge for each Geocode.

Parcels rejected by the tax system as invalid were updated using Washington County's most recent Parcel Database, dated 12-31-03. Most of the parcels classified as invalid had

experienced development therefore resulting in a geocode change. Typically an agricultural parcel was developed into single family residential unit or other land use type.

After all Geocodes and charges were uploaded into the tax system database, a certified list of Geocodes and charges were given back to the SWWD. These certified charges were then linked back into the most recent Washington County Parcel Database dated 12-31-03. Using the certified parcels a final database was created containing attributes such as Geocode, charge, impervious percentage, total REUs, and source of impervious data. These data are included in electronic Appendix C.

Tables 3 and 4 and Figure 8 summarize the final SWWD Stormwater Utility REUs assigned by Washington County for tax year 2004. Discrepancies between Tables 3 and 4 and Tables 1 and 2 are a result of changes in the Parcel Database during the update process.

Table 3. Final Stormwater Utility REUs as Assigned by Washington County

Landuse	Total Parcels	Total REUs
Single Family Residential	19,187	18,484.00
Commercial, Industrial	274	7,539.01
Institutional	49	1,788.21
Multifamily Residential	3,138	2,897.14
Agricultural	330	330.00
Government	118	1831.93
Condo	1,976	1,482
Vacant	422	352
Road, Pond	868	0.00
Total	**26,362**	**34,704.29**

Table 4. Final Breakdown of REUs as Assigned by Washington County

	Number of REUs		
	Commercial, Industrial, Multifamily Residential, Institutional	**Single Family Residential, Condo, Agricultural, Vacant**	**Total REUs**
Oakdale	546.90	327.00	873.90
Lake Elmo	324.74	26	350.74
Woodbury	6,296.61	9,217.00	15,513.61
Afton	0	10	10
Cottage Grove	6,888.04	9,586.00	16,474.04
Within 25% Project Area Subwatershed	**14,056.29**	**19,166.00**	**33,222.29**
Within 75% Project Area Subwatershed	7,167.50	9,264.00	16,431.50
Within City of Woodbury and 75% Project Area Subwatershed	6,295.86	8,901.00	15,196.86

6. Future Stormwater Utility Updates

The following steps should be taken for future updates to the SWWD Stormwater Utility.

1. Obtain updated Washington County Parcel Database, Washington County Assessor's Database, Washington County Condo Code Database, aerial photos, and municipal impervious coverages. *In 2004, Washington County information will be obtained by July 15 and will be current through June 30, 2004.*

2. Create a separate database from original Washington County Parcel Database that includes all invalid Geocodes (greater than 12 digits in length).

3. Link previous year's SWWD Stormwater Utility Database to updated Parcel Database and identify number of new parcels and changed Geocodes

4. Determine and update land use of new parcels, parcels with changed Geocodes, and parcels identified as vacant in previous years Stormwater Utility Database.

5. Update new Stormwater Utility Database with impervious data for all new or changed commercial, industrial, government, institutional, and multifamily residential land uses using city databases or hand digitizing.

6. Verify REF based on new SFR construction and update table of percent impervious and equivalent REF as needed.

7. Assign REU values to all land uses based on percent impervious and parcel size or standard value.

8. Determine and assign dollar value per REU and calculate utility charges per parcel for certification to Washington County. *In 2004, a public hearing will be held in August and final certification to the County will take place at the September regular Board meeting.*

9. Submit table including Geocode and charge to Washington County Assessor's Department.

10. Update SWWD Stormwater Utility Database as needed through year in response to inquiries and problems identified during collection of fees.

Figure 1

Source of Impervious Data

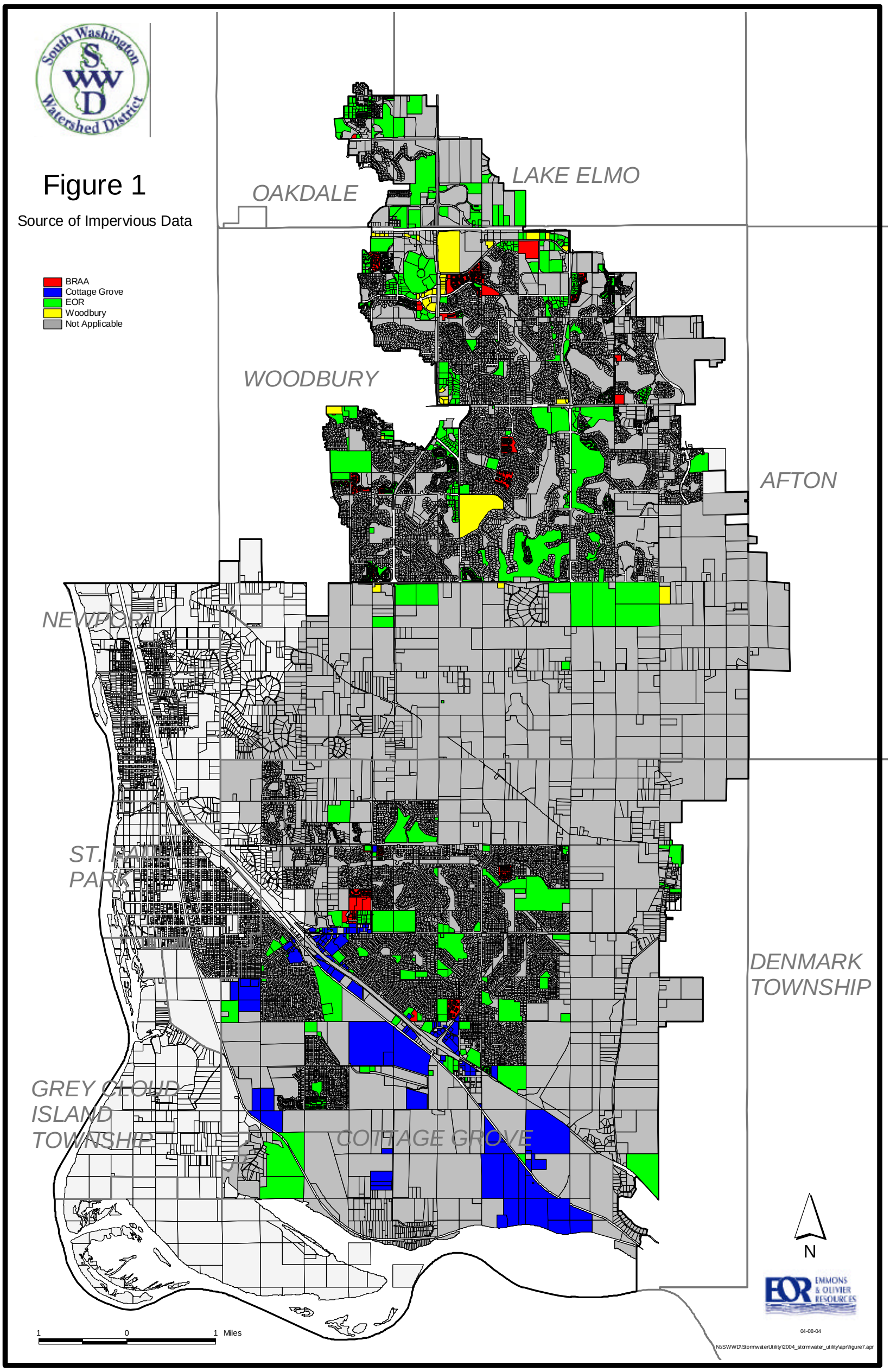



Figure 2
Single Family Residential Units
REU Value: 1.00 per parcel

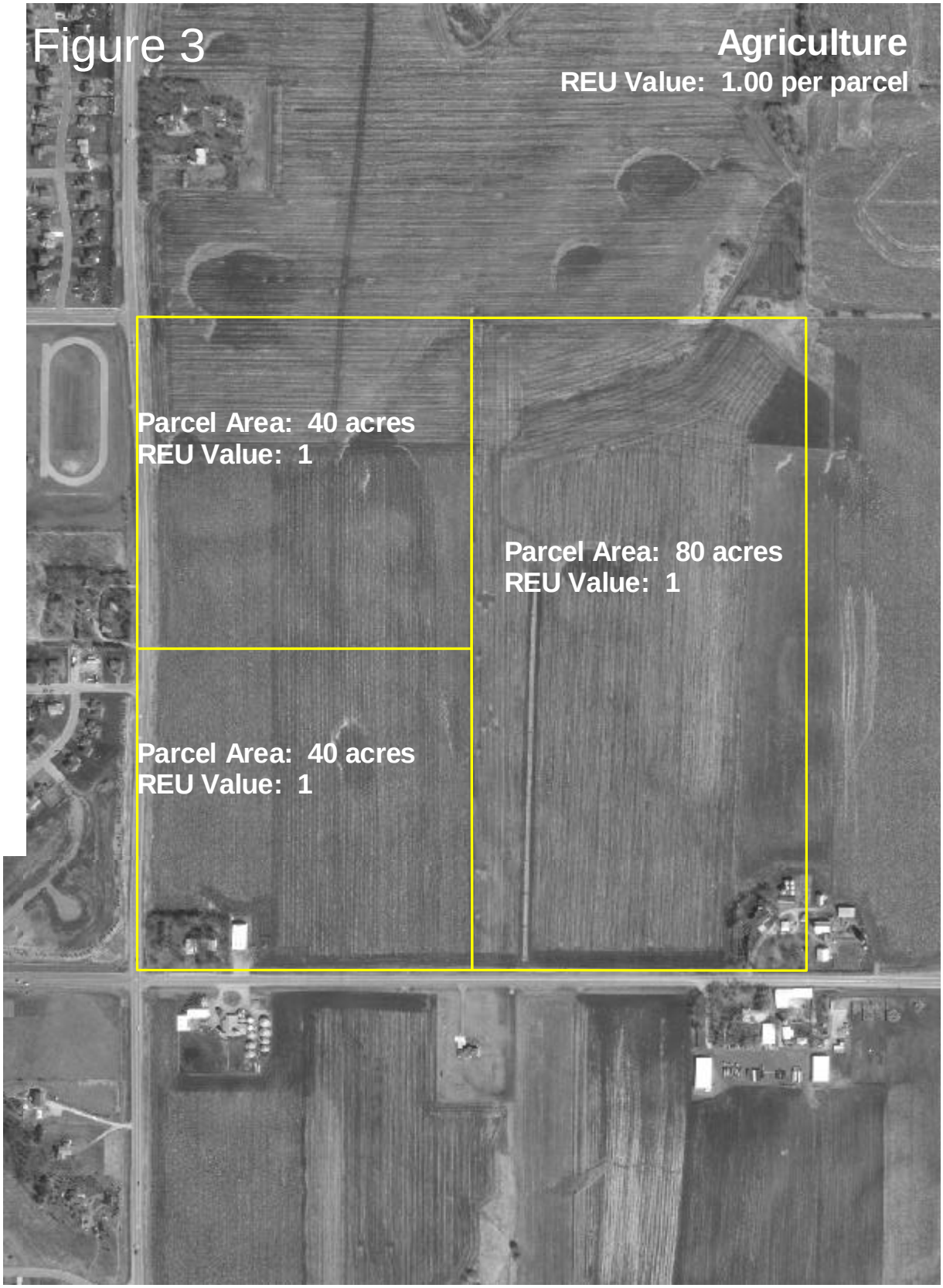


Figure 3
Agriculture
REU Value: 1.00 per parcel
Parcel Area: 40 acres
REU Value: 1
Parcel Area: 80 acres
REU Value: 1
Parcel Area: 40 acres
REU Value: 1


Figure 4
State Farm Insurance
Parcel Area: 72.1 acres
Impervious Area: 20.17 acres
Percent Impervious: 28%
REU Value: 191.66


Figure 5
3M Cottage Grove
Parcel Area: 79.7 acres
Impervious Area: 22.7 acres
Percent Impervious: 28%
REU Value: 211.98


Figure 6
Cottage Grove School Property
Parcel Area: 104.64 acres
Impervious Area: 20.72 acres
Percent Impervious: 20%
REU Value: 229.15


Figure 7
Condominium Units
REU Values: 0.75per Condo owner
This example contains 15 parcels with an associated 145 condos.
A total of 108.75 REUs will be charged to these parcels.

South Washington Watershed District

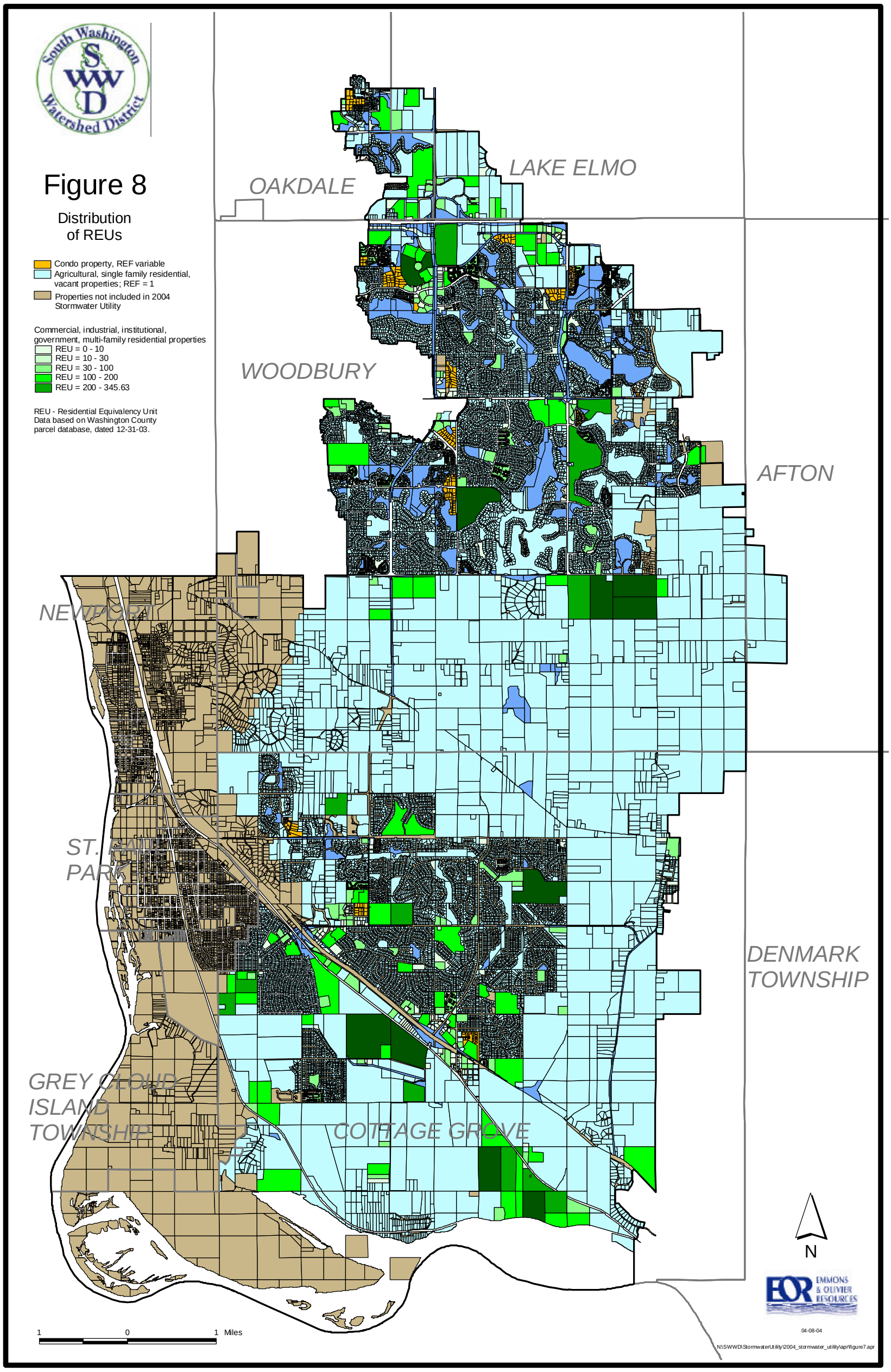
Figure 8

Distribution of REUs

Condo property, REF variable
Agricultural, single family residential, vacant properties; REF = 1
Properties not included in 2004 Stormwater Utility

Commercial, industrial, institutional, government, multi-family residential properties
REU = 0 - 10
REU = 10 - 30
REU = 30 - 100
REU = 100 - 200
REU = 200 - 345.63

REU - Residential Equivalency Unit
Data based on Washington County parcel database, dated 12-31-03.



Appendix A

BRAA Report, dated 6-5-00

Appendix B

Washington County Land Use Codes and Associated SWWD Classification

Washington County Land Use Code	Washington County Description	SWWD Classification
101	Agricultural	Agricultural
103	Ag\Duplex\Triplex	Agricultural
106	Son/Dau-Moth/Fath	Agricultural
151	Seasonal Rec Res	Agricultural
201	Residential	Single Family Residential
202	Residential Agriculture	Single Family Residential
203	Res Duplex/Triplex	Multi Family Residential
204	Res 1 Unit	Single Family Residential
205	Res 4 or More Units	Multi Family Residential (Vacant Parcels Included)
206	Res 1-3 Units	Single Family Residential (Vacant Parcels Included)
214	Student Housing	Commercial/Industrial
215	For Profit Hospital	Institutional
220	MFG Home Park	Single Family Residential
228	4D 1-3 Units	Single Family Residential
229	4D 4 or More Units	Multi Family Residential
231		Institutional
230	Pub-Util Atth Mach	Government
233	Comm Land & Bldgs	Commercial/Industrial (Vacant Parcels Included)
234	Inds Land & Bldgs	Commercial/Industrial (Vacant Parcels Included)
240	Pub Util Atth Mach	Government
243	Comm Land & Bldgs	Commercial/Industrial
244	Inds Land & Bldgs	Commercial/Industrial (Vacant Parcels Included)
247	Qualify Golf Course	Commercial/Industrial (Vacant and Government Parcels Included)
248	Metro Non-Profit	Institutional
255	Res 4+Owners Value	Multi Family Residential
901	Public Schools	Institutional
902	Private Schools	Institutional
905	Private Colleges	Institutional
911	Public Burying Grounds	Institutional
915	Churches	Institutional
916	Church Rectories	Institutional
917	Other Church Resdncs	Institutional
918	Church Service Prpty	Institutional

Washington County Land Use Code	Washington County Description	SWWD Classification
920	Public Hospitals	Institutional
921	Private Hospitals	Institutional
931	Charitable Institute	Institutional
941	Fed/State Forests/Pk	Government
951	Fed Public Property	Government
952	State Public Property	Government
953	Cnty Service Prpty	Government
954	Cnty Lenfrc/Fire/Adm	Government
955	County Other	Government
956	Municipal Pub Servic	Government
957	Mun Lenfrc/Fire/Adm	Government
958	Municipal Other	Government
959	Sp Tax Dists Prpty	Government
961	Tax Forfeit	Government
962		When owned by government = Government When owned by private organization = Vacant
965	Twp/City Road	Government
966	County Road	Government
967	State Road	Government
981	State Acquired	Government
983	County Administered	Government
990	Pilt-County HRA	Government
994	Pilt-State	Government

Appendix C

Electronic Database and Field Naming Convention

The following table summarizes the fields that are included in the attribute table associated with the attached electronic database entitled 2004_stormwater_utility.dbf.

Field Name	SWWD Description
Geocode	Contains County Geocode
Landuse	Contains the land use
Imp_pct	Contains the percent impervious
REU	Contains the number of REUs
Charge	Contains Dollar amount charged to parcel
Source	Contains Source of Impervious Data