

## Isinglass Annual Water Use versus Stream Flow – Calendar Year 2005

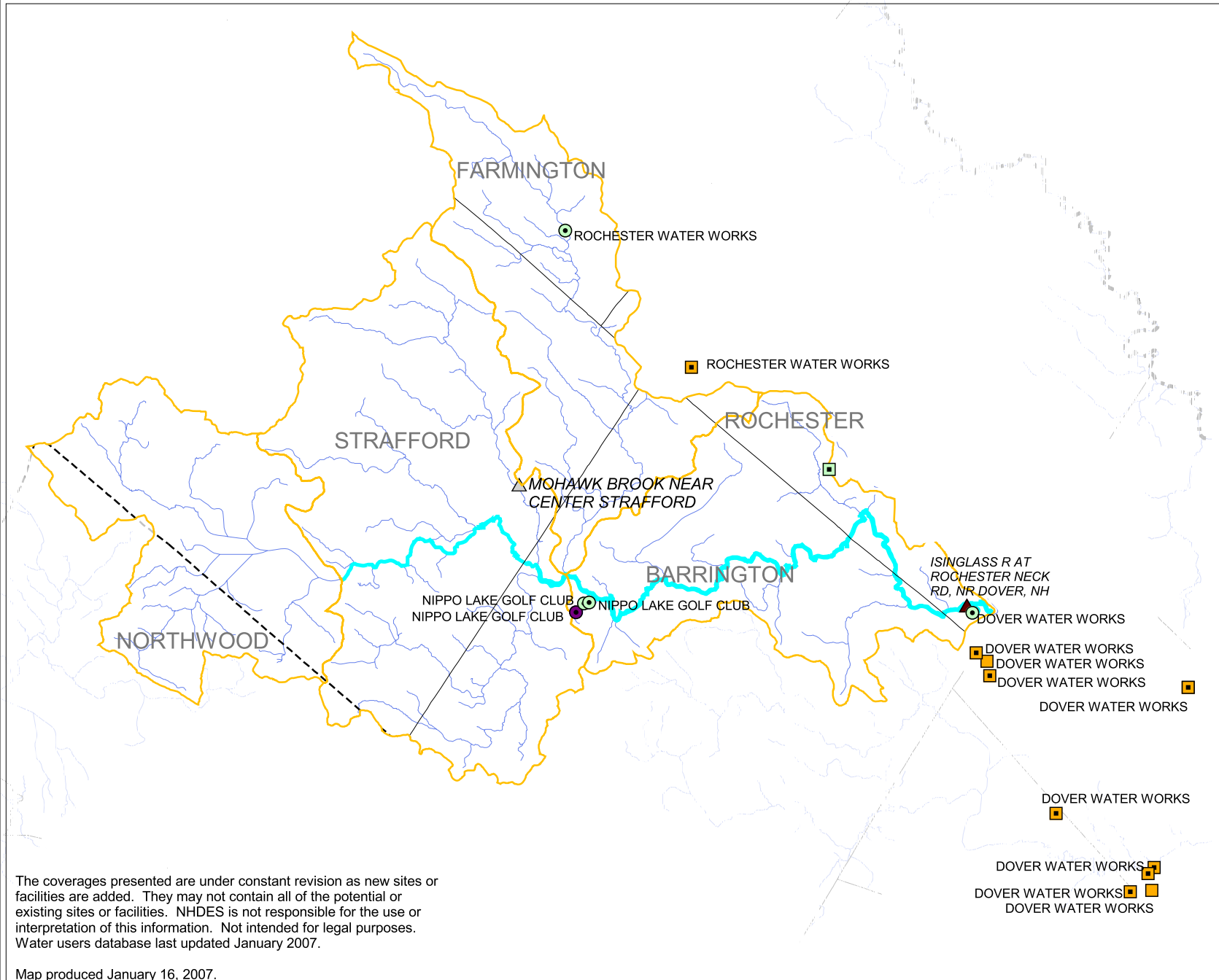
Water use was reported by four sources and no returns in the Isinglass Water Management Planning Area. DES identified two registered withdrawal sources that are unmetered and do not report withdrawals. DES was able to generate an estimated water use for one of the sources. Only two of the four quantified sources met the definition of an Affected Water User. The rules require a user to have a source or withdrawal within 500 feet of a tributary to the Designated River. Three sources, two at Nippo Lake Golf Club (a groundwater and a surface water source for irrigation with reported water use of 12,193,000 gallons between April and October 2005) and one at Paradise Estates (water supply- reported water use of 0 gallons for 2005), were not included in this assessment because they did not meet the definition of an Affected Water User. Water use in July 2005 by these three sources averaged 3,258 gallons per day representing 2.0% of the reported water use in the watershed.

The Water Management Planning Area has no hydropower facilities. Assessed water use was entirely for two public water supply sources for the cities of Rochester and Dover. Rochester diverts water from the Berry River tributary into a reservoir outside of the Water Management Planning Area. Rochester also diverts water from Berry River to Round Pond within the Water Management Planning Area and then from Round Pond to the Rochester Reservoir. The diversion from Round Pond is unquantified. Dover withdraws water from the Isinglass River from a location near the end of the Designated River.

The beginning of the Isinglass Designated River is the outflow of Bow Lake Dam in Strafford. The Designated section of the river flows 6.7 miles to where it is joined by the Berry River and another 12.2 miles to where it enters the Cocheco River for a total Designated length of 17.9 miles. The Isinglass Water Management Planning Area covers 74 square miles and includes a streamflow gage (USGS 01072870 ISINGLASS R AT ROCHESTER NECK RD, NR DOVER, NH.) measuring 73.6 square miles of the watershed. For this report the average monthly streamflow was transposed areal to all impact points on the Designated River. The 2005 assessment resulted in twelve months not in compliance with the General Standard. The Isinglass Designated River was not in compliance with the General Standard during any month in 2004 from the confluence with Berry River to the end of the Designated River (Mile 11.2 to 0.0). It must be noted however that this conclusion is drawn from the Department's estimated water use for Rochester. Rochester diverts water from behind a dam on Berry River. Water is diverted behind this dam to a two-foot pipe that feeds by gravity drainage to Rochester Reservoir. The water use estimate for Rochester's withdrawal from Berry River is based on the expected drainage from the watershed area of the diversion dam which is 8.7 square miles. Flow estimates for a two-foot diameter concrete pipe were made using Chazy-Mannings equation with any stream flow in excess of this amount assumed to overtop the dam. This matches Department staff observation that all the water above the dam is diverted at lower flows. Reconnaissance survey in July 2007 noted that some water was leaking from the dam to Berry River downstream of the diversion. This year's assessment adjusts the diversion to account for this leakage. Despite using approximations in this assessment process for pipe flow and leakage, the amount of the exceedence of the General Standard is of such magnitude, that the conclusion is correct, while the magnitude remains an estimate.

Isinglass Designated River	River Miles not in Compliance with General Standard (0 at the mouth)	Length of River Miles not in Compliance with General Standard	Maximum value of Aggregate WU /Stream flow	Previously not in Compliance with the General Standard (2003 to present)
January	11.2 to 0.0	11.2	13%	2003, 2004
February	11.2 to 0.0	11.2	14%	2003, 2004
March	11.2 to 0.0	11.2	18%	2003, 2004
April	11.2 to 0.0	11.2	9%	2003, 2004
May	11.2 to 0.0	11.2	11%	2003, 2004
June	11.2 to 0.0	11.2	16%	2003, 2004
July	11.2 to 0.0	11.2	11%	2003, 2004
August	11.2 to 0.0	11.2	7%	2003, 2004
September	11.2 to 0.0	11.2	7%	2003, 2004
October	11.2 to 0.0	11.2	7%	2003, 2004
November	11.2 to 0.0	11.2	11%	2003, 2004
December	11.2 to 0.0	11.2	14%	2003, 2004

# Isinglass River Affected Water User Facilities: Source and Discharge Locations



## Legend

### Affected Water Users

- Source
- Discharge

### Affected Water Users (outside WMPA)

- Source
- Discharge

### Water Users (outside 500 ft of hydrology)

- Source
- Discharge

### Stream Gages

- ▲ Active
- ▲ Inactive

~ Designated Reach

~ Hydrology

    State boundary

    Town boundary

    WMPA

The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2007.

Map produced January 16, 2007.

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0 1 2 Miles

2005 Isinglass Water Use in CFS															
WU_NAME	FACILITY	WUSD_ID	DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Start DR	Bow Lake		14.26												
ROCHESTER CITY	ROCHESTER WATER WORKS	20011 20011-S03	57.29	15.246	16.574	27.314	27.314	27.314	17.602	6.431	0.672	0.425	27.314	27.314	27.314
ROCHESTER CITY	ROCHESTER WATER WORKS	20011 20011-S02	57.29												
DOVER WATER DEPARTMENT	WATER WORKS	20006 20006-S09	73.71	3.346	3.088	3.292	3.337	3.131	3.258	1.837	0.000	0.000	0.000	3.344	2.156
End Point DR	Confluence Isinglass and Cocheco		73.84												

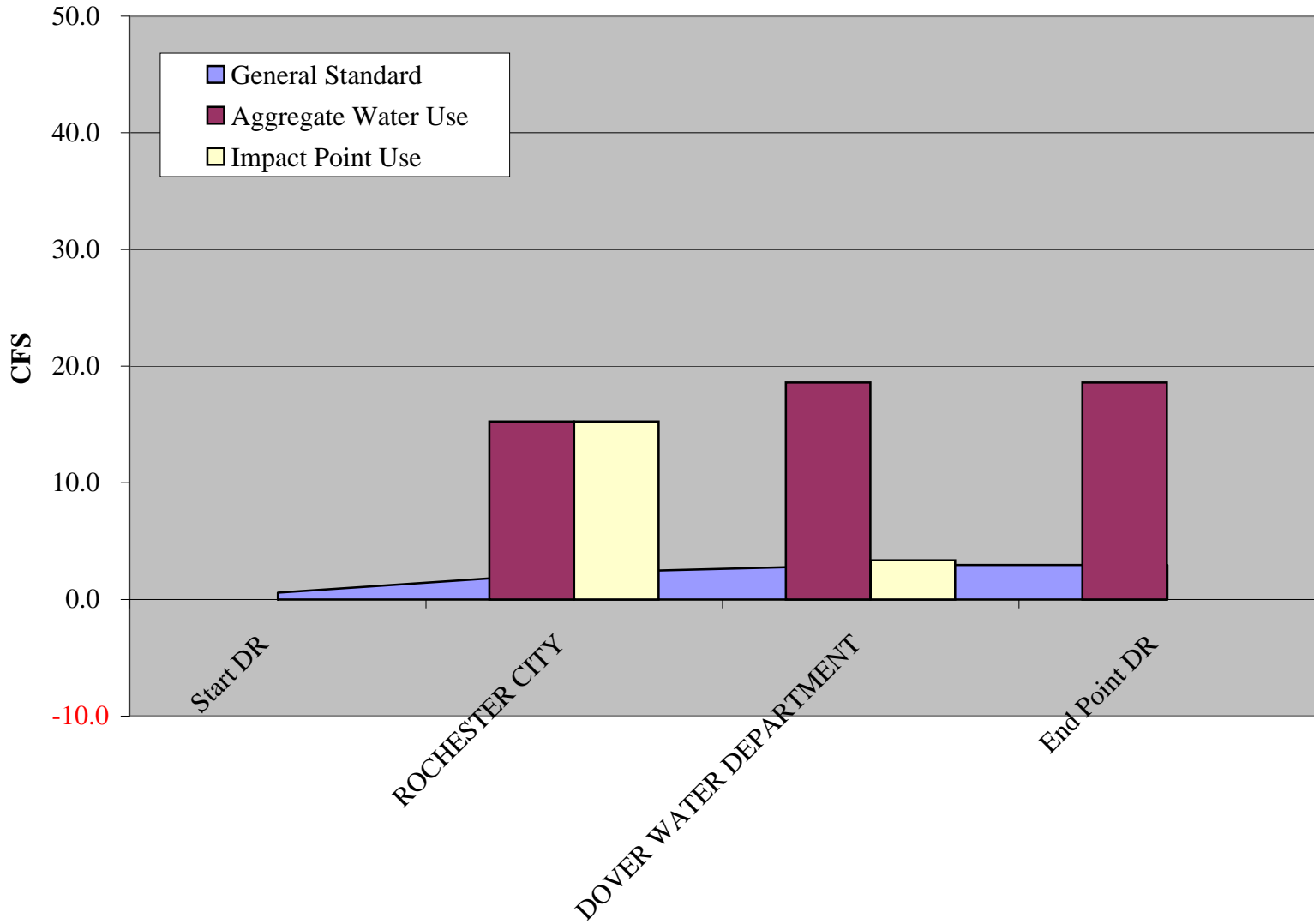
2005 Isinglass Aggregate Water Use in CFS															
WU_NAME	FACILITY	WUSD_ID	DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Start DR	Bow Lake		14.26	0	0	0	0	0	0	0	0	0	0	0	0
ROCHESTER CITY	ROCHESTER WATER WORKS	20011 20011-S03	57.29	15.246	16.574	27.314	27.314	27.314	17.602	6.431	0.672	0.425	27.314	27.314	27.314
DOVER WATER DEPARTMENT	WATER WORKS	20006 20006-S09	73.71	18.593	19.662	30.607	30.651	30.445	20.861	8.268	0.672	0.425	27.314	30.658	29.470
End Point DR	Confluence Isinglass and Cocheco		73.84	18.593	19.662	30.607	30.651	30.445	20.861	8.268	0.672	0.425	27.314	30.658	29.470

2005 Isinglass Estimated Monthly Stream Flow at Each Impact Point in CFS															
WU_NAME	FACILITY	WUSD_ID	DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Start DR	Bow Lake		14.26	29	29	38	80	59	28	14	2.3	1.5	97	61	50
ROCHESTER CITY	ROCHESTER WATER WORKS	20011 20011-S03	57.29	118	117	153	320	238	112	57	9.3	6.0	391	244	200
DOVER WATER DEPARTMENT	WATER WORKS	20006 20006-S09	73.71	152	150	197	411	306	144	73	12	7.7	503	314	258
End Point DR	Confluence Isinglass and Cocheco		73.84	153	151	197	412	307	144	73	12	7.7	504	315	258

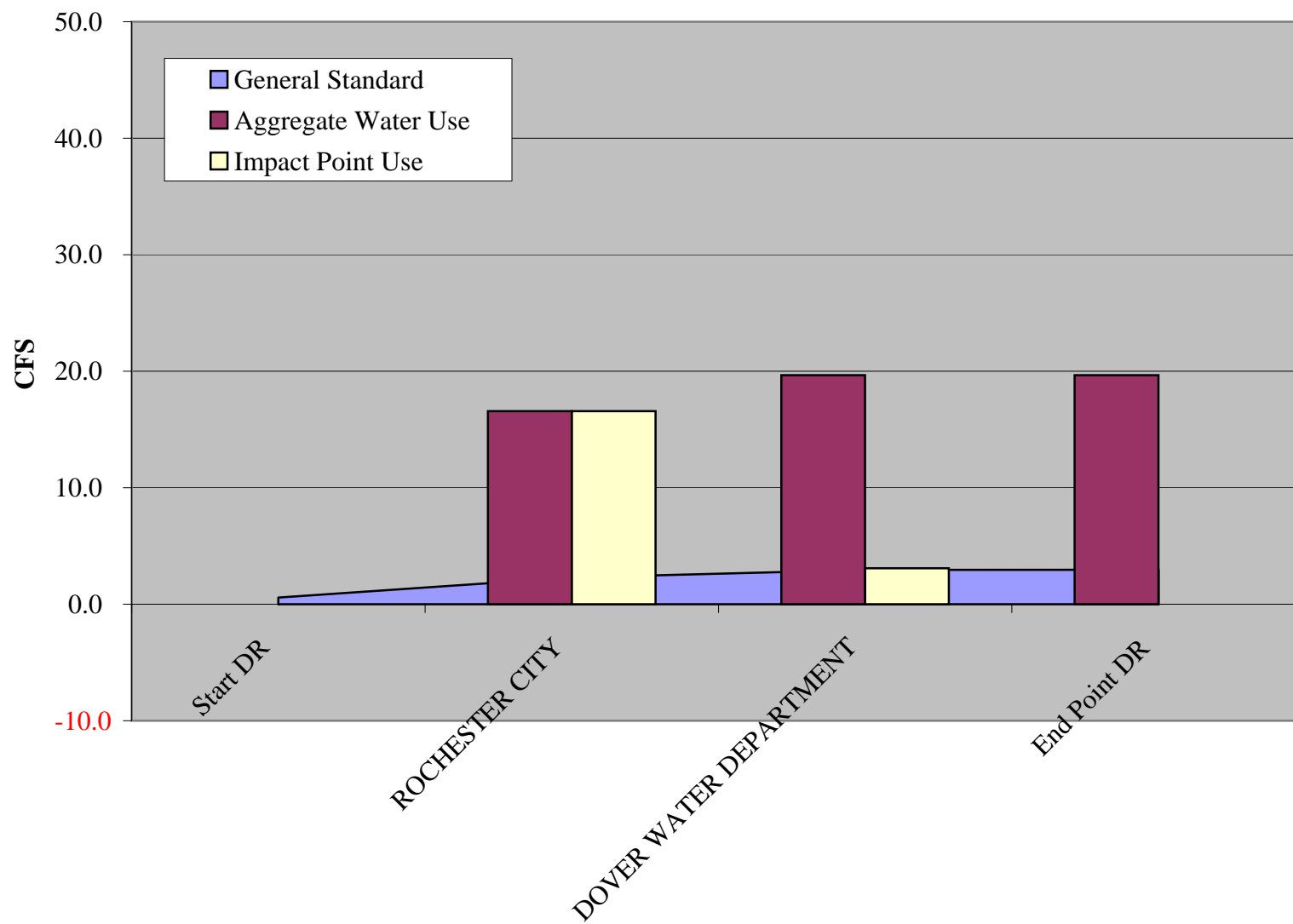
2005 Isinglass Estimated Monthly General Standard at Each Impact Point in CFS															
WU_NAME	FACILITY	WUSD_ID	DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Start DR	Bow Lake		14.26	0.57	0.57	0.57	2.3	2.28	0.57	0.285	0.024	0.02	2.28	2.28	0.57
ROCHESTER CITY	ROCHESTER WATER WORKS	20011 20011-S03	57.29	2.3	2.3	2.3	9.2	9.2	2.3	1.15	0.10	0.1	9.2	9.2	2.3
DOVER WATER DEPARTMENT	WATER WORKS	20006 20006-S09	73.71	2.9	2.9	2.9	11.8	11.8	2.9	1.47	0.13	0.1	11.8	11.8	2.9
End Point DR	Confluence Isinglass and Cocheco		73.84	2.95	2.95	2.95	11.8	11.81	2.95	1.477	0.127	0.13	11.81	11.81	2.95

2005 Isinglass Estimated Monthly Margin of the Aggregate Water Use Below the General Standard in CFS															
WU_NAME	FACILITY	WUSD_ID	DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Start DR	Bow Lake		14.26	0.57	0.57	0.57	2.3	2.3	0.57	0.29	0.02	0.02	2.3	2.3	0.57
ROCHESTER CITY	ROCHESTER WATER WORKS	20011 20011-S03	57.29	(13.0)	(14.3)	(25.0)	(18.1)	(18.1)	(15.3)	(5.3)	(0.57)	(0.33)	(18.1)	(18.1)	(25.0)
DOVER WATER DEPARTMENT	WATER WORKS	20006 20006-S09	73.71	(15.6)	(16.7)	(27.7)	(18.9)	(18.7)	(17.9)	(6.8)	(0.55)	(0.30)	(15.5)	(18.9)	(26.5)
End Point DR	Confluence Isinglass and Cocheco		73.84	(15.6)	(16.7)	(27.7)	(18.8)	(18.6)	(17.9)	(6.8)	(0.55)	(0.30)	(15.5)	(18.8)	(26.5)

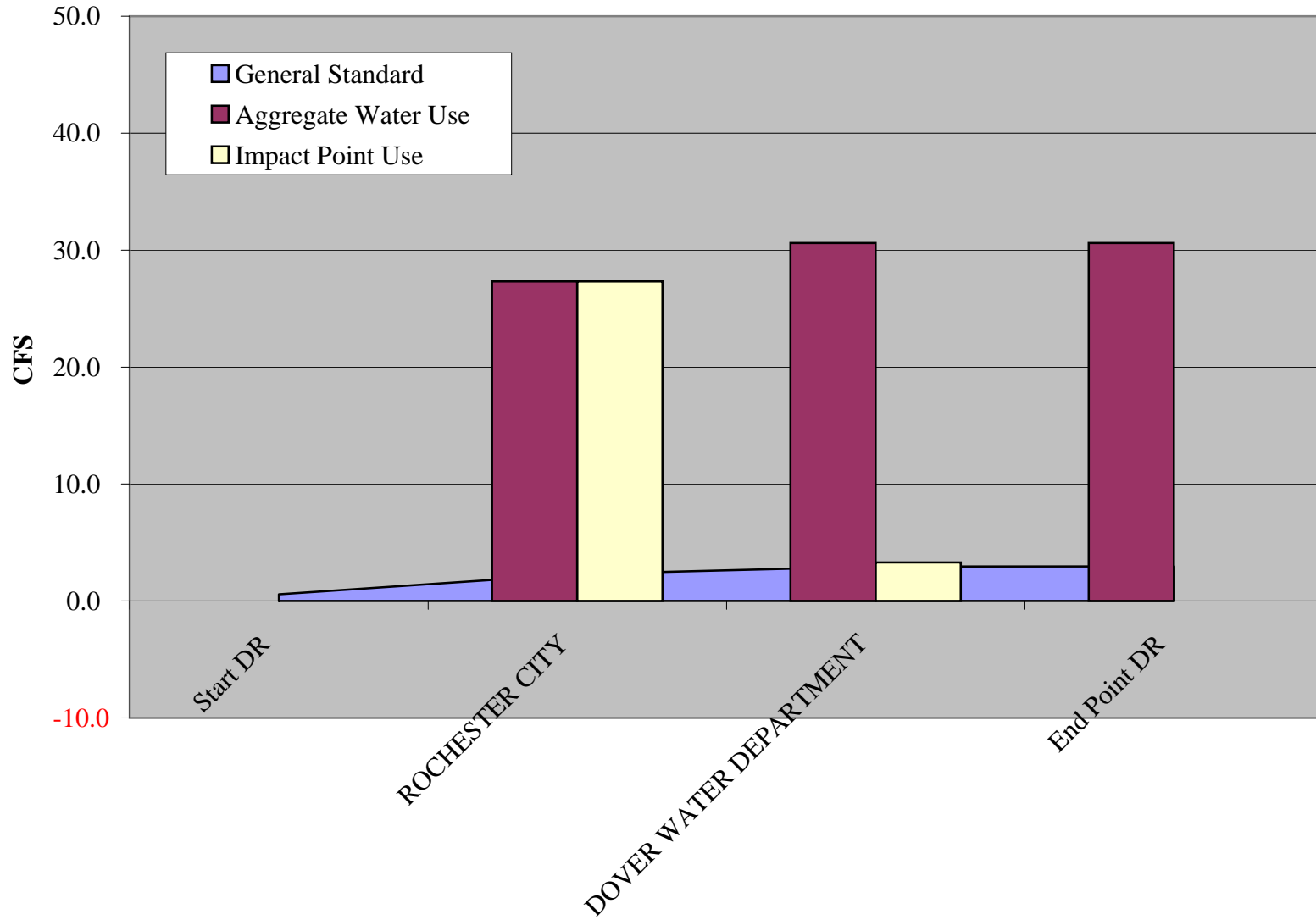
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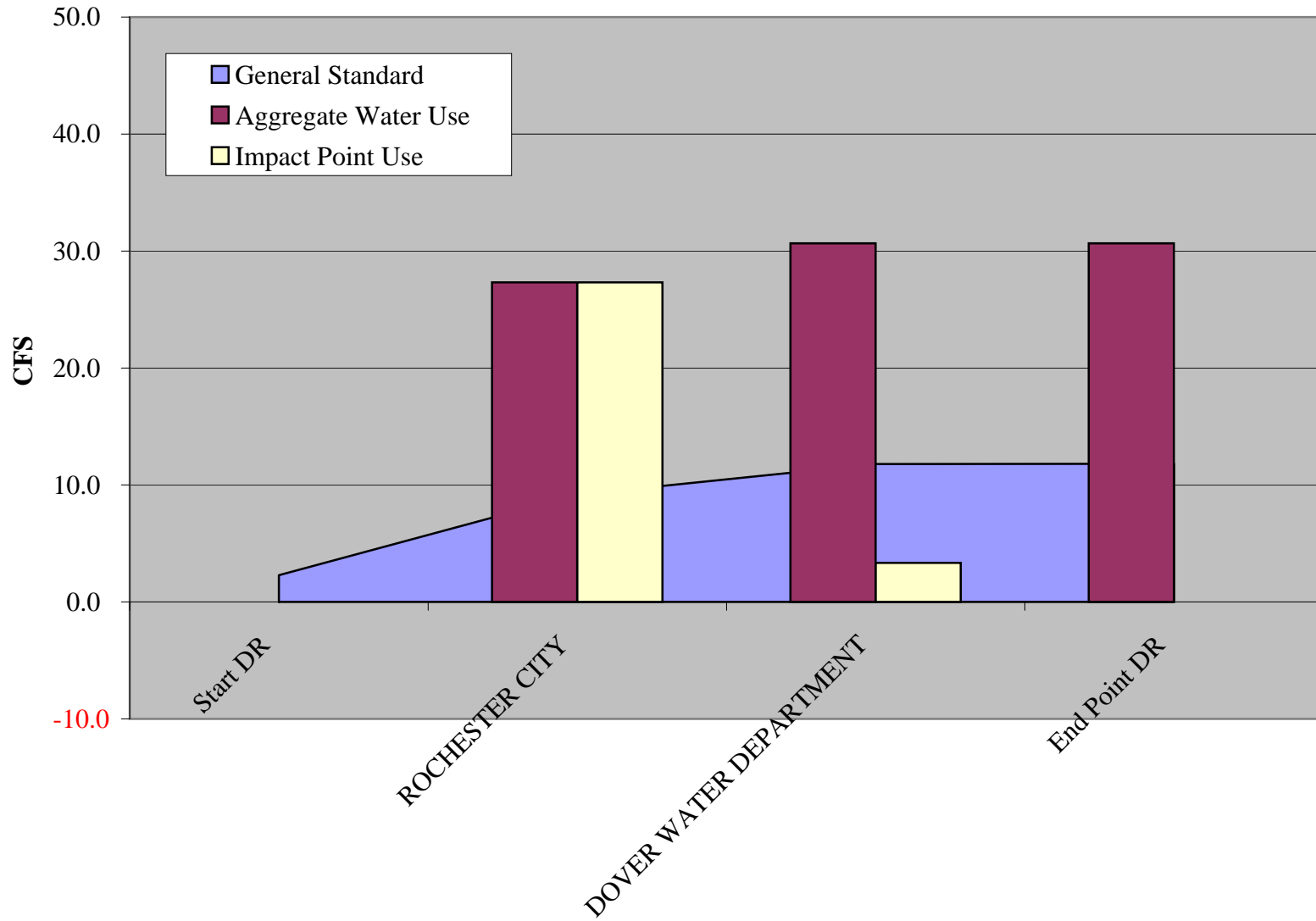
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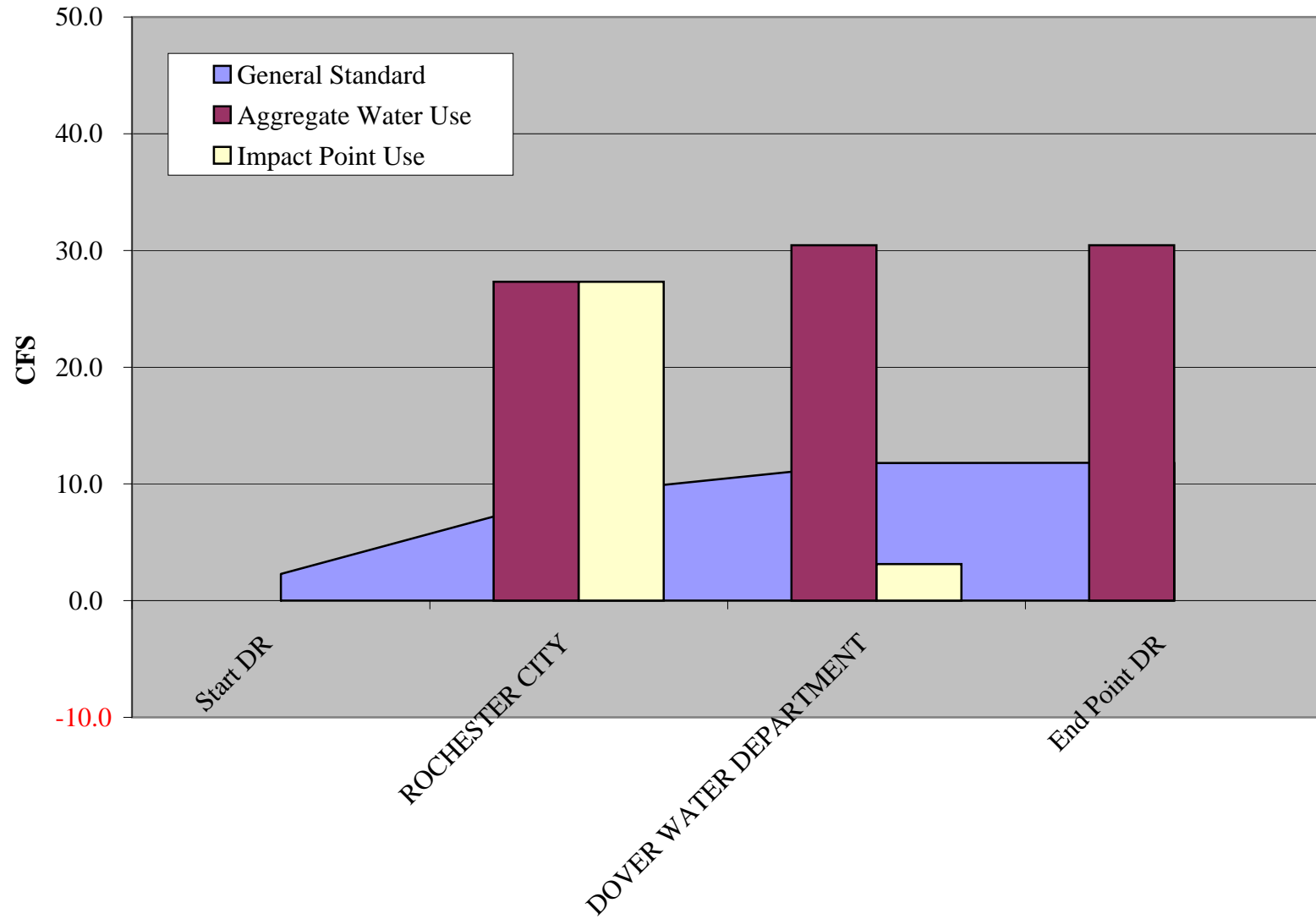
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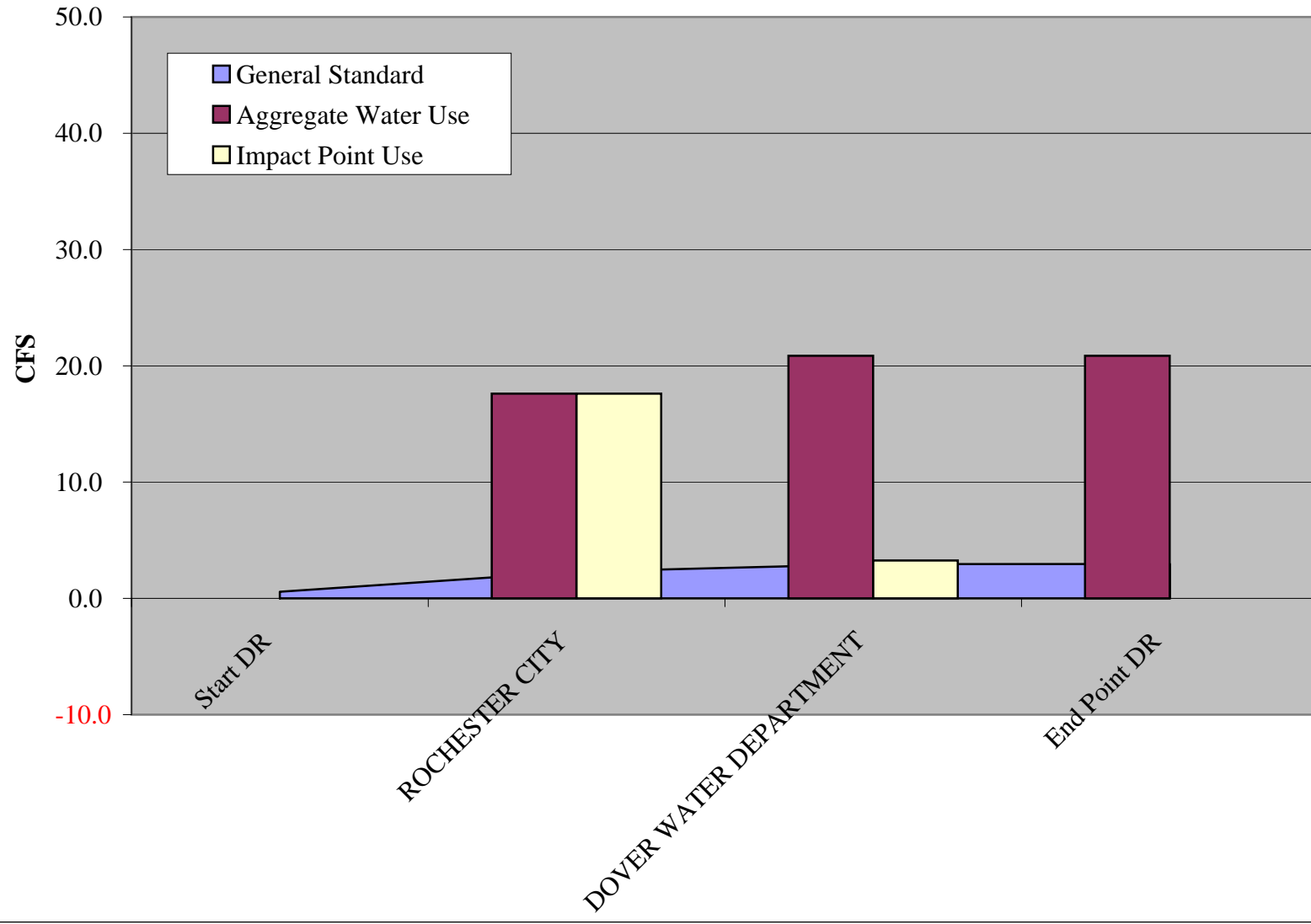
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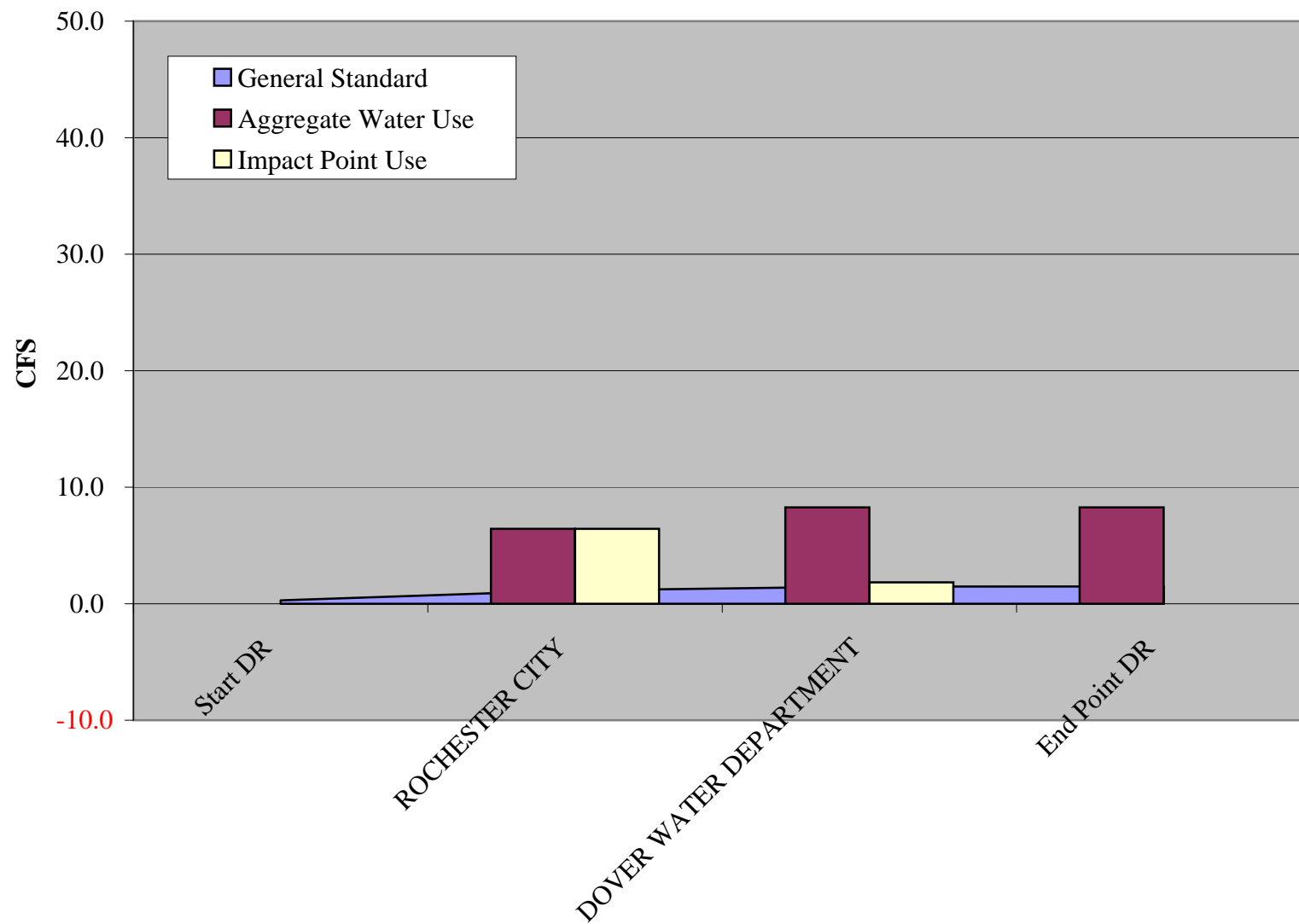
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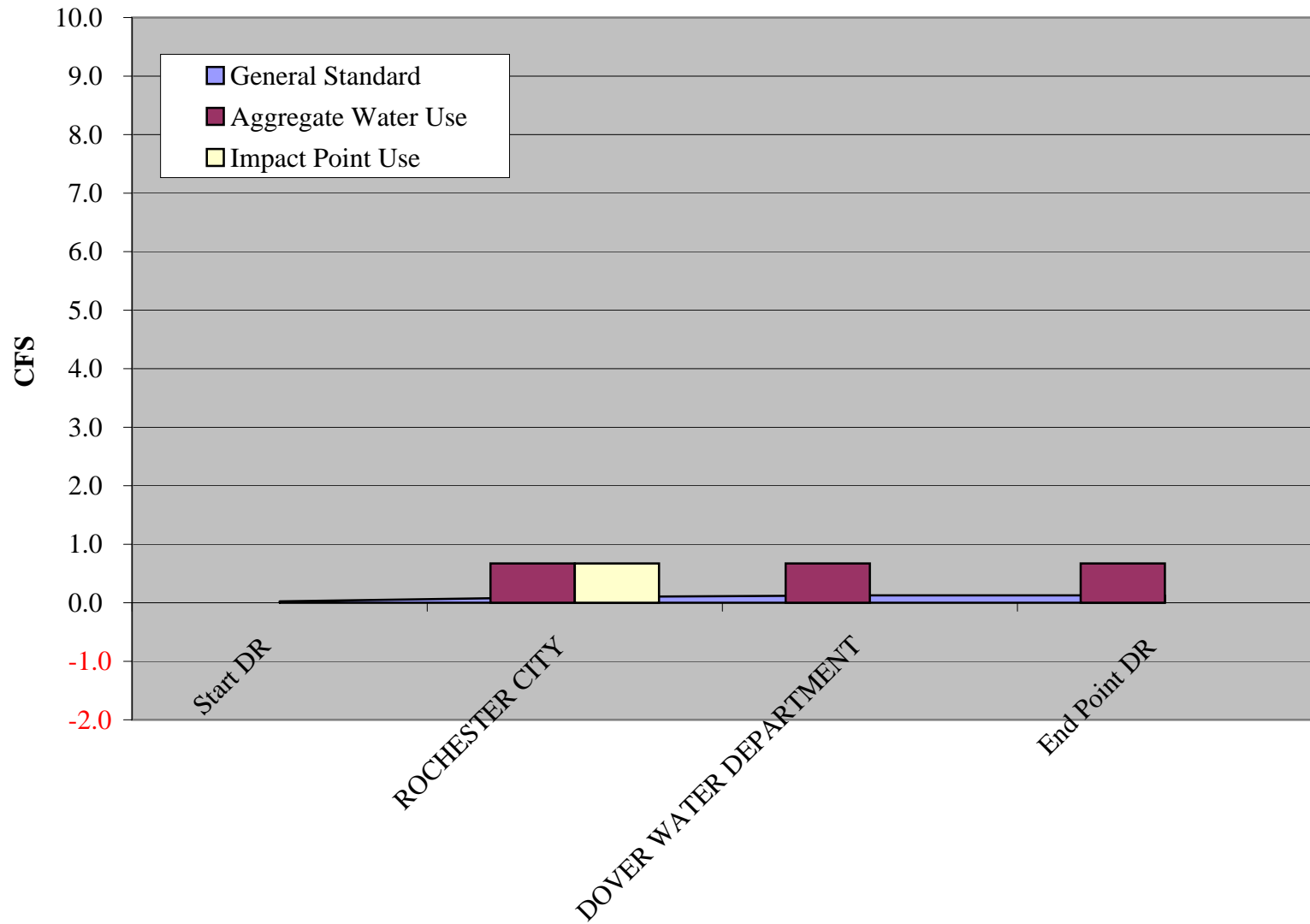
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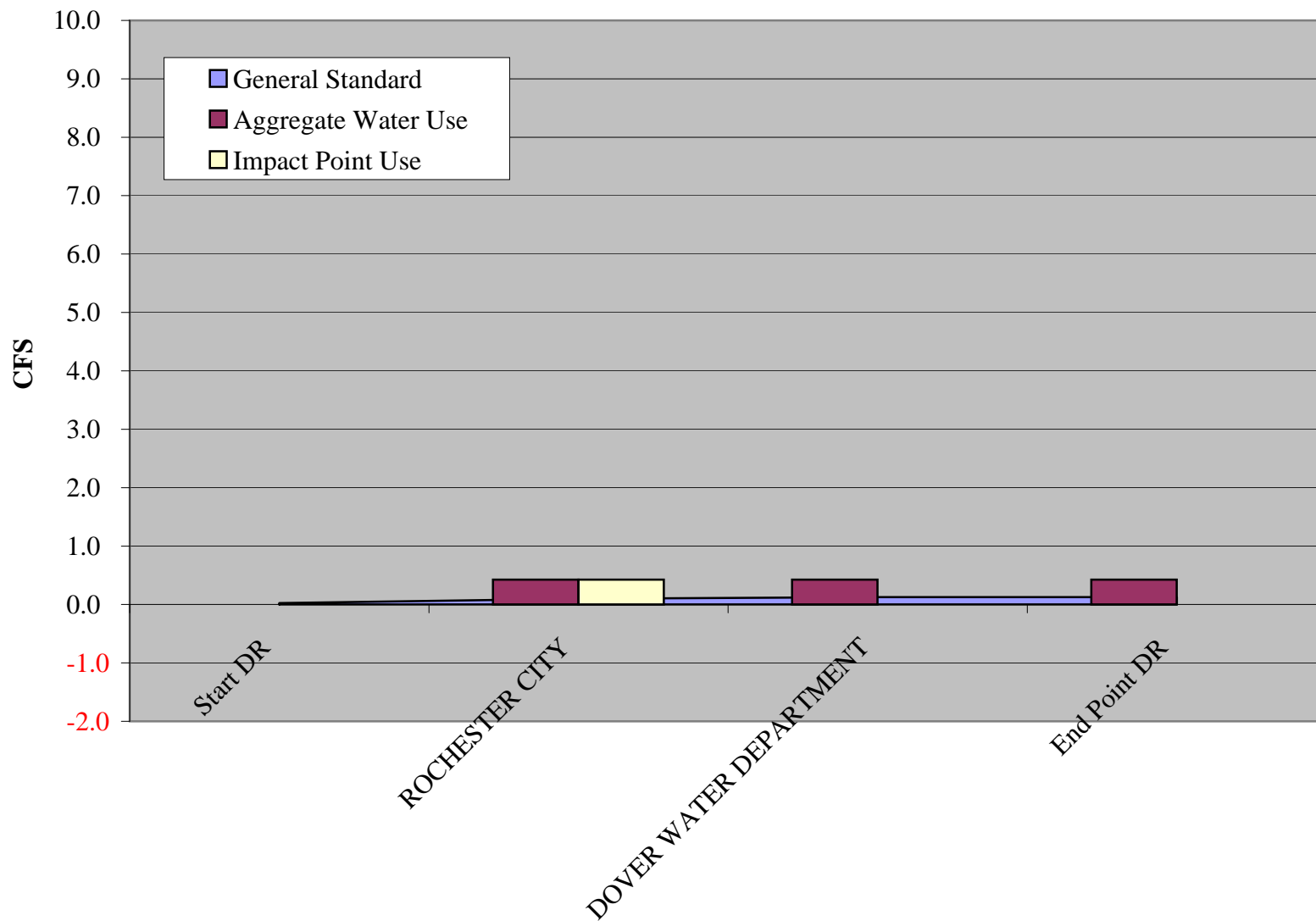
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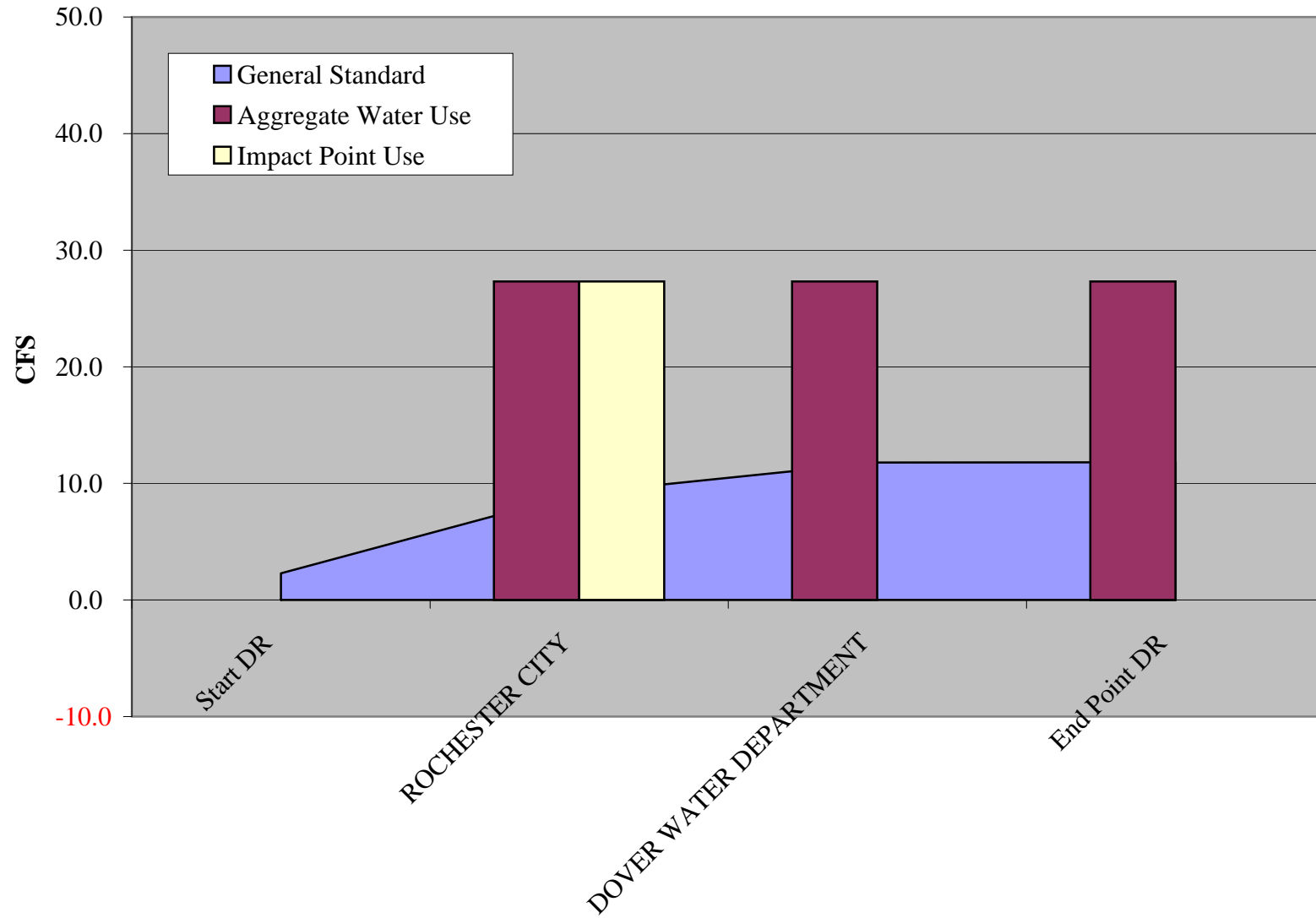
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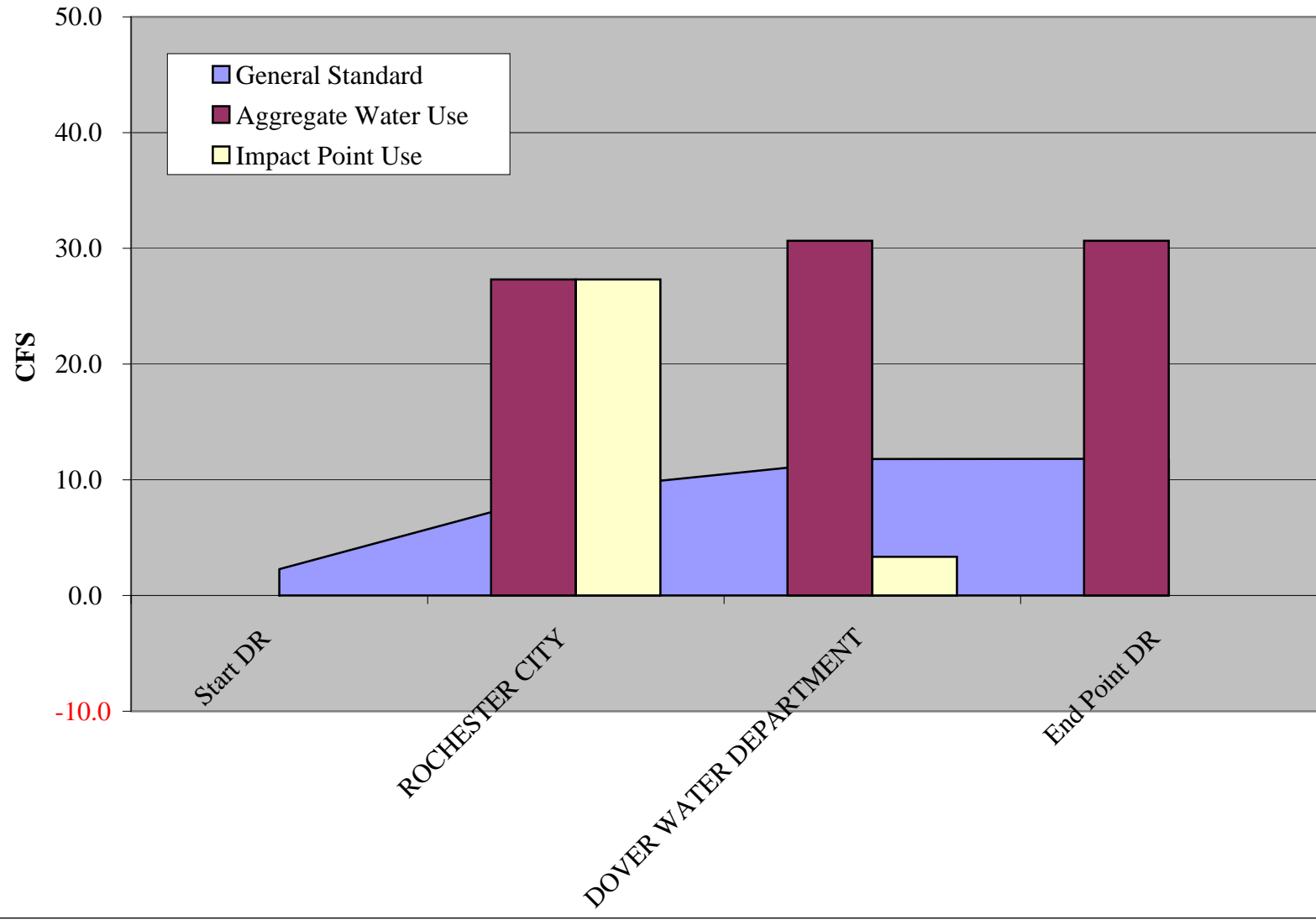
# September 2005 Isinglass



# October 2005 Isinglass



# November 2005 Isinglass



# December 2005 Isinglass

