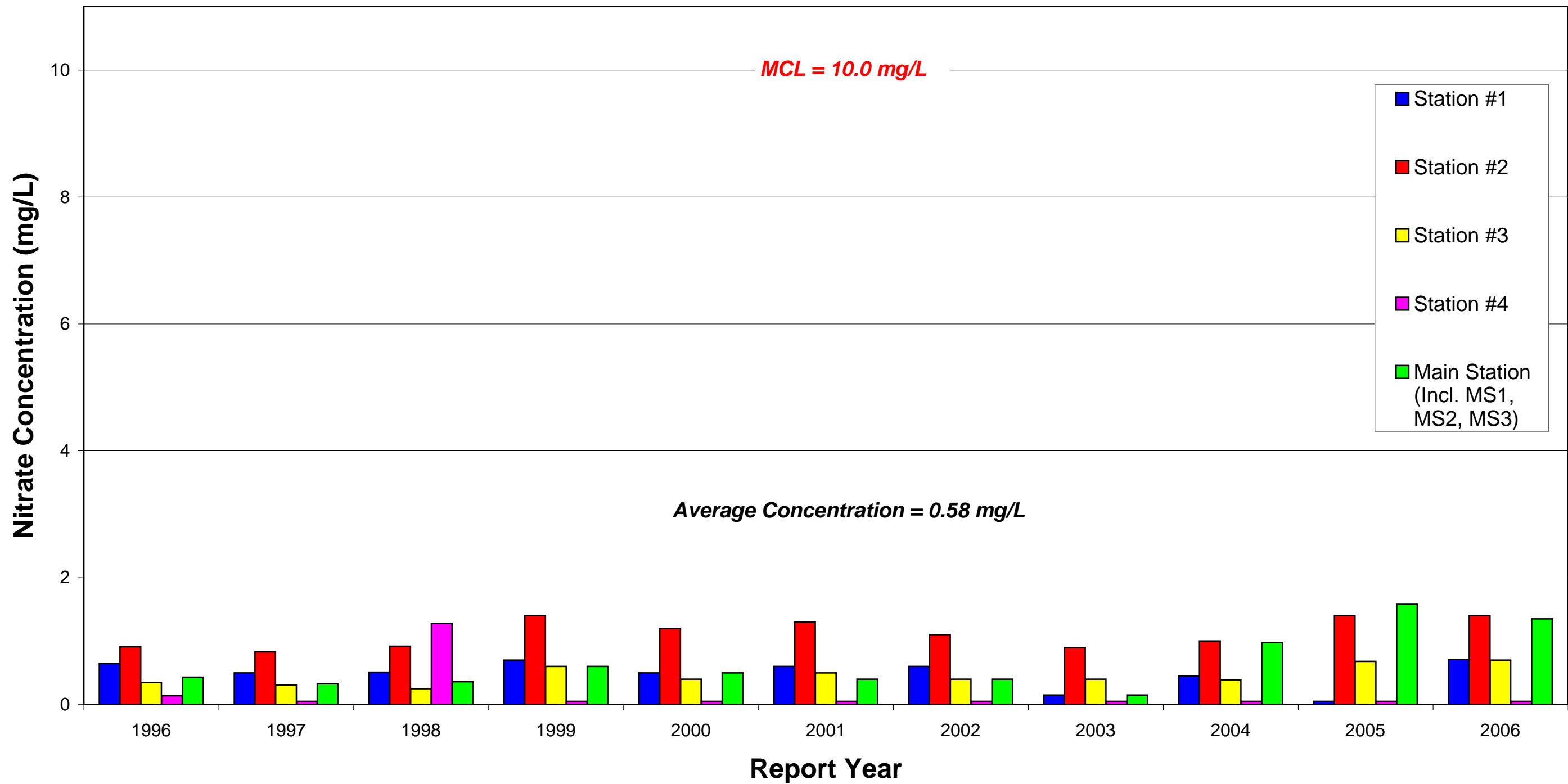


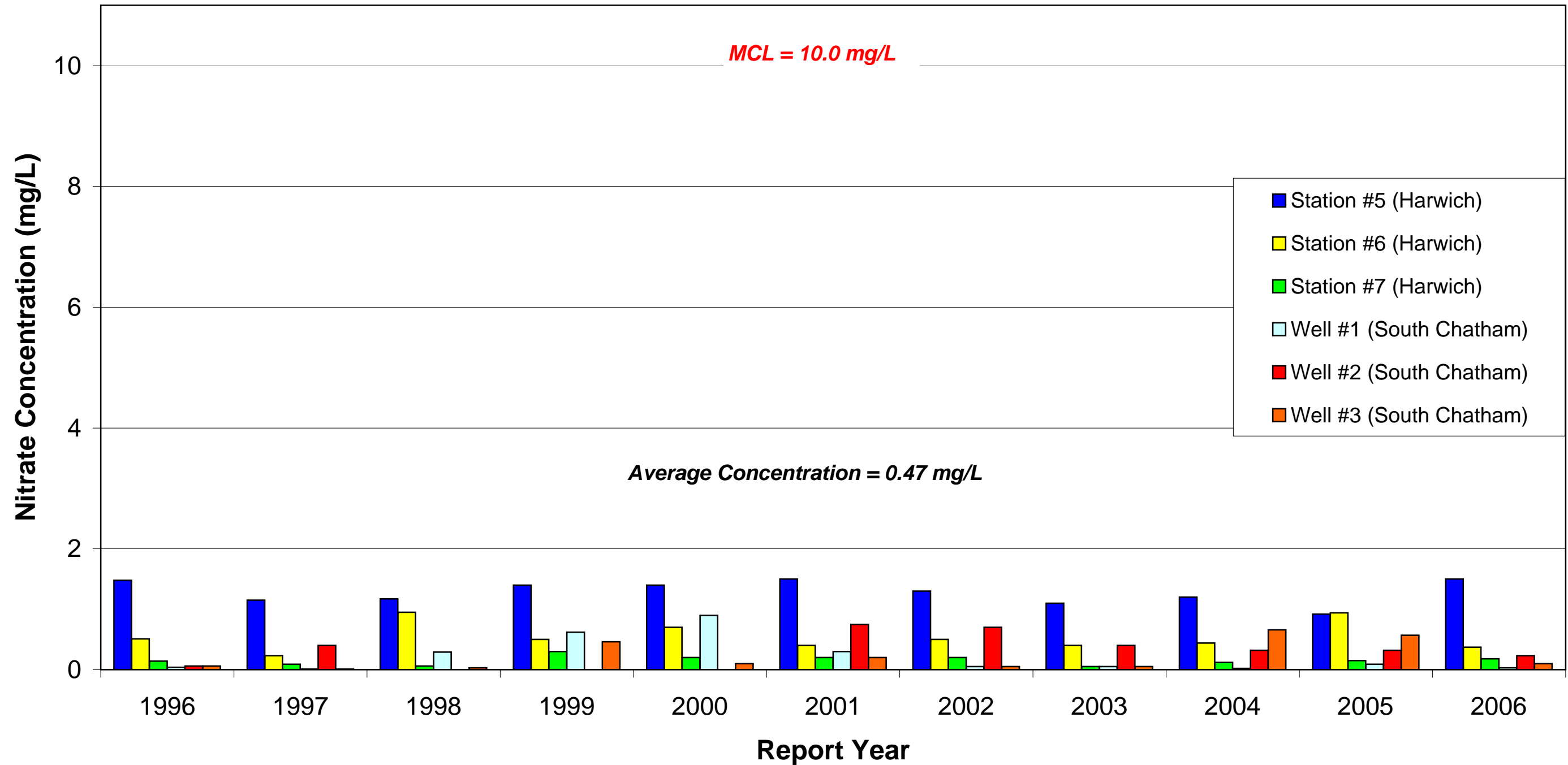
APPENDIX A

NITRATE TRENDS IN DOWNGRADIENT WATER SUPPLY WELLS

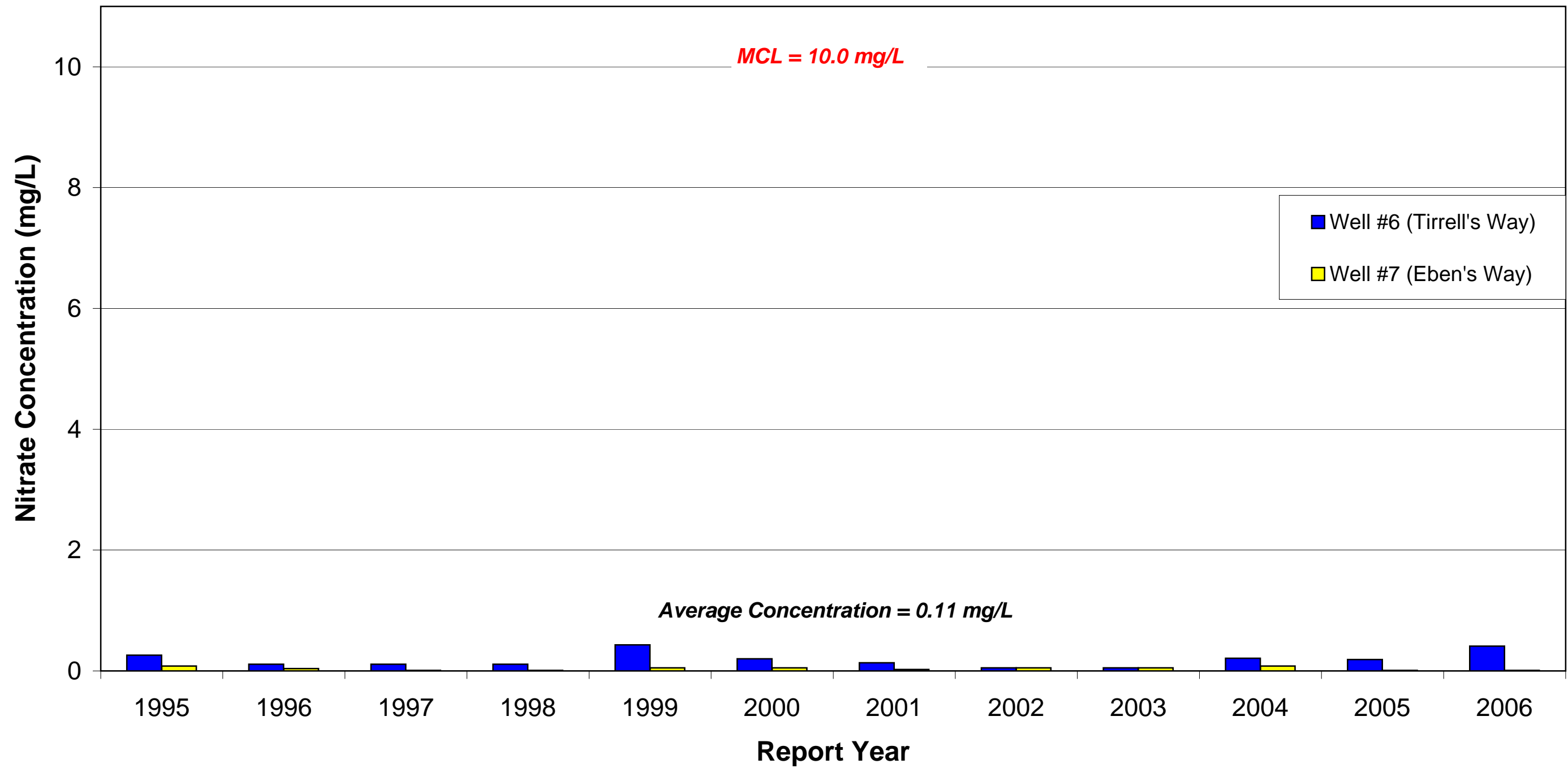
NITRATE TRENDS OF HARWICH WELLFIELD NO. 1



NITRATE TRENDS OF HARWICH WELLFIELD NO. 2 AND SOUTH CHATHAM WELLS NO. 1, 2, AND 3



NITRATE TRENDS OF THE CHATHAM TOWN FOREST WELLS NO. 6 AND 7



APPENDIX B

NITROGEN LOADING CALCULATION METHODOLOGY

Appendix B.

Nitrogen Loading Methodology

The calculation of the various components of the watershed loadings are briefly described below.

- a. The wastewater loading is the product of:
 - 1) The number of houses in the watershed.
 - 2) The typical wastewater flow for each house at approximately 150 gpd/house.
 - 3) The wastewater concentration after “treatment” in the septic system and in the ground above the water table at 24 mg/L.
 - 4) The necessary conversion factors to express the loading in pounds per year (lbs/year).
- b. The lawn infiltration loading is a product of:
 - 1) The number of houses (lawns) in the watershed.
 - 2) The typical lawn loading factor of 1.1 lb/lawn/year.
 - 3) The factor of 365 to express the loading in lbs/year.
- c. Golf course irrigation loading is a product of:
 - 1) The golf course area (in units of 1,000 ft²) in the watershed.
 - 2) The golf course turf loading factor of 0.66 lb/1,000 ft²/year).
- d. The road runoff and infiltration loading is the product of:
 - 1) The road area in the watershed calculated from aerial photos and Geographic Information Systems (GIS).

- 2) Recharge rate of 40 inches/year.
 - 3) The concentration of this runoff and infiltration water (1.5 mg/L).
 - 4) The conversion factors to express the loading in lbs/year.
- e. The roof runoff and infiltration loading is the product of:
- 1) Roof area estimated at 1,600 ft²/house.
 - 2) The number of houses in the watershed.
 - 3) The concentration of this runoff and infiltration water.
 - 4) Recharge rate of 40 inches/year.
- f. The natural area infiltration loading is the product of:
- 1) Natural (forest and shrub) area, which is the watershed area minus the pond, road, law, and roof areas.
 - 2) Recharge rate of 27 inches/year.
 - 3) Natural area recharge concentration of 0.072 mg/L.
 - 4) The conversion factors to express the loading in lbs/year.
- g. The pond area loading is the product of:
- 1) Pond area.
 - 2) Precipitation rate of 40 inches/year.
 - 3) Concentration of precipitation at 1.1 mg/L.
 - 4) The conversion factor to express the loading in lbs/year.

These are the main nitrogen loadings in the Great Sand Lakes watersheds and in the down-gradient water supply watersheds. This same sort of calculation methodology could be used to calculate loadings from any additional nitrogen sources in the watershed, such as loadings from wastewater treatment plants, agricultural areas, and possible industrial

or commercial discharges. The planning areas for this project do not have these loadings, but many watersheds on Cape Cod and elsewhere need to consider these sources.

APPENDIX C

LABORATORY ANALYSIS OF TWO GROUNDWATER SAMPLES

ENVIROTECH LABORATORIES, INC.
MA CERT. NO.: M-MA 063

8 Jan Sebastian Drive
 Sandwich, MA 02563
 (508)888-6460 1-800-339-6460
 FAX (508)888-6446

Monday, June 26, 2006

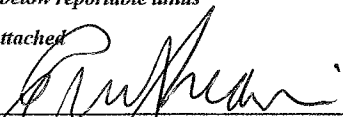
Stearns & Wheeler
 PO Box 975
 Hyannis MA 02601

ProjectName: Harwich GSL Comments: □□
Project Number: 50225.11
Collection Date: 06/14/06 **Collection Time:**
Sampled By: Nate Weeks
Lab Order Number: WW-2006-854
Date Received: 06/14/06

Sample Type	Sample Time	Sample Date	Comments			
2 PP (GSL 1 & 2) A	10:30	06/14/06				
Parameters	Units	Test Results	Reportable Limits	Date Analyzed	Analyst	Method
Kjeldhal Nitrogen	mg/L	BRL	0.5	06/19/06	LF	351.3
Nitrate-N	mg/L	0.485	0.05	06/15/06	LL	300.0
Nitrite-N	mg/L	BRL	0.020	06/15/06	LL	300.0
Total Nitrogen	mg/L	0.5	NA	06/19/06	LL	Calculation
Total Phos -grab	mg/L	0.003	0.003	06/22/06	MC	4500-P
Sample Type	Sample Time	Sample Date	Comments			
26 PPC (GSL 3 & 4) B	13:30	06/14/06				
Parameters	Units	Test Results	Reportable Limits	Date Analyzed	Analyst	Method
Kjeldhal Nitrogen	mg/L	BRL	0.5	06/15/06	LF	351.3
Nitrate-N	mg/L	3.99	0.05	06/15/06	LL	300.0
Nitrite-N	mg/L	BRL	0.020	06/15/06	MC	300.0
Total Nitrogen	mg/L	4	NA	06/15/06	LL	Calculation
Total Phos -grab	mg/L	0.006	0.003	06/22/06	MC	4500-P

BRL=below reportable limits

*see attached

By: 
 Ronald J. Saari
 Laboratory Director