

I. TABLE OF CONTENTS

I.	Table of Contents.....	2
II.	Executive Summary	3
III.	Project Background.....	7
IV.	Task 1 - Project Administration and Management	8
V.	Task 2 – Public Outreach and Technical Assistance.....	10
A.	Public Outreach Campaign	10
1.	Toxic Algae and Nutrient Reduction Web Pages.....	10
2.	Toxic Algae Awareness and Nutrient Reduction Mailers	11
3.	Workshops on Algae, Nutrients, and Lake Health	11
B.	Volunteer Recruitment.....	11
C.	Septic System Outreach.....	12
1.	Septic System Mailers	12
2.	Septic System Workshops	13
D.	Technical Assistance	13
E.	Assessment of Public Outreach and Technical Assistance Activities.....	14
1.	Implementation Effectiveness	14
2.	Overall Outreach Project Effectiveness.....	14
VI.	Task 3 - Early Detection and Notification	19
A.	Water Quality and Algae Monitoring Activities.....	19
B.	Algae Monitoring Results	19
1.	Cyanobacterial Blooms And Toxin Tests	19
2.	<i>In-Situ</i> Chlorophyll <i>a</i> And Phycocyanin Levels.....	26
3.	Phytoplankton.....	34
C.	Algae Monitoring Data Analysis	36
1.	Is cyanobacterial scum a good indicator of toxin presence?	37

2.	Is <i>in-situ</i> chlorophyll <i>a</i> or <i>in-situ</i> phycocyanin a good proxy for measuring levels of cyanobacteria?	39
3.	Are <i>in-situ</i> chlorophyll <i>a</i> , <i>in-situ</i> phycocyanin, or any other environmental factors good indicators of current cyanobacterial scum or toxin presence?	42
4.	Can <i>in-situ</i> chlorophyll <i>a</i> or <i>in-situ</i> phycocyanin readings or any other environmental factors (e.g. temperature, rainfall, thermocline depth, water transparency, etc.) help predict the onset of future cyanobacterial blooms or toxin production?.....	50
D.	SonicSolution® Units Monitoring Results and Analysis	52
1.	SonicSolution® Unit Monitoring Protocols.....	52
2.	SonicSolution® Unit Monitoring Results	53
3.	SonicSolution® Unit Monitoring Analysis And Conclusions	61
E.	Algae Monitoring Conclusions.....	65
F.	Public Notification Activities.....	66
VII.	Summary of Project Results and Future Actions	68

II. EXECUTIVE SUMMARY

The Cyanobacteria Prevention and Early Detection project focused on three lakes—Lake Cassidy, Lake Ketchum, and Lake Loma—that have experienced blooms of toxic blue-green algae (cyanobacteria) in recent years (Figure II-1). The project was conceived and implemented by the Surface Water Management Division (SWM) of Snohomish County Public Works and funded by a \$28,500 grant from the Washington State Department of Ecology (Ecology) Freshwater Algae Program. The project began in June 2008 and was completed in July 2010.

The goals of the project were 1) to increase public awareness of toxic cyanobacterial blooms and their causes, 2) to reduce the risks to human and animal health from toxic algae, and 3) to help citizens control nutrient sources that feed algal blooms. The project addressed public awareness and nutrient reduction through a variety of educational outreach efforts. The project reduced risks by implementing early detection and notification measures and by extensive monitoring to identify patterns that lead to toxic algal blooms.