



# IDAHO SOIL & WATER CONSERVATION COMMISSION

**REGULAR MEETING NOTICE & AGENDA**  
**Idaho Soil & Water Conservation Commission**  
**April 13, 2017, 9:00 a.m. to 12:00 p.m. MST**

*Idaho Water Center, 322 E Front St, Suite 560, Boise*

**TELECONFERENCE # 1-877-820-7831 Passcode: 922837**

The Commission will occasionally convene in Executive Session, pursuant to Idaho Code § 74-206(1).  
 Executive Session is closed to the public.

### AMERICANS WITH DISABILITIES ACT COMPLIANCE

*The meeting will be held in facilities that meet the accessibility requirements of the Americans with Disabilities Act. If you require special accommodations to attend, participate in, or understand the meeting, please contact the Idaho Soil & Water Conservation Commission at (208) 332-1790 or Info@swc.idaho.gov so advance arrangements can be made.*

*Members of the public may address any item on the Agenda during consideration of that item. Those wishing to comment on any agenda item are requested to indicate so on the sign-in sheet in advance. Copies of agenda items, staff reports and/or written documentation relating to items of business on the agenda are on file in the office of the Idaho Soil & Water Conservation Commission in Boise. Upon request, copies can be emailed and will also be available for review at the meeting.*

	<b>1.</b>	<b>WELCOME, SELF-INTRODUCTIONS, AND ROLL CALL</b>	Chairman Wright
	<b>2.</b>	<b>AGENDA REVIEW</b> <i>Agenda may be amended after the start of the meeting upon a motion that states the reason for the amendment and the good faith reason the item was not included in the original agenda.</i>	Chairman Wright
	<b>3.</b>	<b>PARTNER REPORTS</b> <i>Typically include NRCS, IASCD, IDEA, Attorney General, DFM, OSC, etc.</i>	
	<b>4.</b>	<b>ADMINISTRATION</b>	
#*	a.	<b>Minutes</b> 1. February 20, 2017 Regular Meeting ACTION: Approve February 20, 2017 meeting minutes	Chairman Wright
#*	b.	<b>Administrator's Report</b> ACTION: Direct staff to consider and make an additional donation of up to \$3,000 to the Idaho NCF International Envirothon should there be a surplus of operating funds at the end of FY 2017	Murrison

(\*) Action Item

(#) Attachment

ACTION: Staff recommended action for Commission Consideration

April 13, 2017 Reg. Meeting Agenda

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#*	c.	<b>Financial Report</b> 1. January 31, 2017 2. February 28, 2017 3. March 31, 2017 ACTION: Approve the Detail Financial Report for the month ended January 31, 2017 Approve the Detail Financial Report for the month ended February 28, 2017 Approve the March 31, 2017 Financial Reports	Yadon
#	d.	<b>FY 2018-2021 Strategic Plan</b> ACTION: For information only	Murrison
#*	e.	<b>FY 2018 Appropriation and Budget Blueprint</b> ACTION: Approve FY 2018 General and Dedicated Fund Blueprints, including setting Trustee and Benefit fund distribution to districts in FY 2018 at: \$425,000 in Base funding, \$678,200 in Match Formula funding, \$100,000 in Operating funding, and \$50,000 for Capacity Building funding.	Yadon
#*	f.	<b>Deep Soil Sampling Project for Marsh Creek, Minidoka, Twin Falls Priority Area</b> ACTION: Approve and authorize Administrator to sign service agreement contracts with Ecopoint and Western Labs for sampling and analysis of project data.	Murrison, Firth
	<b>5.</b>	<b>PROGRAMS</b>	
	a.	<b>Resource Conservation &amp; Rangeland Development Program Report</b> ACTION: For information only	Hoebelheinrich
	<b>6.</b>	<b>OTHER BUSINESS</b>	
	a.	<b>Reports</b> ACTION: For information only	Commissioners, Staff
	<b>7.</b>	<b>RECONVENE IN OPEN SESSION to ADJOURN.</b> The next regular meeting is scheduled to be held in Boise on May 11, 2017.	

(\*) Action Item

(#) Attachment

ACTION: Staff recommended action for Commission Consideration

April 13, 2017 Reg. Meeting Agenda

Date of Notice: April 6, 2017



# Idaho Soil & Water Conservation Commission

322 E Front St, Suite 560 • Boise Idaho 83702  
Telephone: 208-332-1790 • Fax: 208-332-1799

## REGULAR MEETING OF THE IDAHO SOIL & WATER CONSERVATION COMMISSION PUBLIC MEETING & TELECONFERENCE

**Date and Time:**

Monday, February 20, 2017  
3:00 PM – 5:00 PM MST

**Location:**

Idaho State Capitol, EW20, 700 W Jefferson St.,  
Boise 83702

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### DRAFT MINUTES

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**COMMISSION MEMBERS PRESENT:**

Norman Wright (Chair)  
Glen Gier  
David Radford

Gerald Trebesch (Vice-Chair) (via teleconference)  
Leon Slichter (Secretary)

**COMMISSION STAFF PRESENT:**

Teri Murrison

Terry Hoebelheinrich

**PARTNERS AND GUESTS PRESENT:**

Shantel Chapple Knowlton, Office of the Attorney General

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**ITEM #1: WELCOME AND ROLL CALL**

Chairman Wright called the meeting to order at 3:00 p.m.

Roll call: Chairman Norman Wright, Commissioners Gerald Trebesch, David Radford, Leon Slichter, and Glen Gier were present.

**ITEM #3: ADMINISTRATION**

Action: Commissioner Radford made a motion to approve the January 18, 2017 minutes.

Commissioner Gier seconded the motion. Motion carried unanimously.

**ITEM #4b: RESOURCE CONSERVATION AND RANGELAND DEVELOPMENT PROGRAM REPORT**

Action: None taken

**ITEM 7a: EXECUTIVE SESSION**

Action: Commissioner Radford made a motion to convene in Executive Session pursuant to Idaho Code § 74-206(1)(b) for the purpose of considering the evaluation of a public employee.

Commissioner Gier seconded the motion. Roll call vote was taken. Chairman Norman Wright, Commissioners Gerald Trebesch, Leon Slichter, David Radford and Glen Gier voted AYE.

21 Executive Session commenced at 3:55 PM.

22

23 Chairman Wright, Commissioners Trebesch, Radford, Slichter, and Gier were present during  
24 Executive Session. Administrator Murrison and Deputy Attorney General Shantel Chapple  
25 Knowlton were also present.

26

27 Executive Session ended at 4:15 PM.

28 Commissioners reconvened in Open Session at 4:16 PM.

29

30 **AGENDA AMENDED:** Commissioner Radford made a motion to amend the agenda to add Item  
31 #3b to receive an Administrator's Report on her trip to Denver to attend the National  
32 Association of Conservation Districts' Annual Meeting, and with Chairman Wright, on the  
33 Washington, DC trip with Idaho conservation partners (NRCS, IASCD). Commissioner Slichter  
34 seconded the motion. Motion carried by unanimous vote.

35 **ITEM #3b ADMINISTRATOR'S REPORT**

36 Action: For information only, no action taken

37

38 **ITEM #7: ADJOURN**

39 The meeting adjourned at 5:00 PM. The next Commission Meeting will be in Boise and via  
40 teleconference on April 13, 2017.

41

42 Respectfully submitted,

43

44

45

46 Leon Slichter, Secretary

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## IDAHO SOIL & WATER CONSERVATION COMMISSION

ITEM #4b

**TO: CHAIRMAN WRIGHT AND COMMISSIONERS RADFORD, GIER, WRIGHT, SLICHTER, AND TREBESCH**  
**FROM: TERI MURRISON, ADMINISTRATOR**  
**DATE: MARCH 28, 2017**  
**RE: ADMINISTRATOR'S REPORT**

### BOARD MATTERS

Attached for your information is a letter of resignation from Commissioner Glen Gier. Unfortunately (for the Commission, not the Giers), Commissioner Gier and his wife plan to move to Arizona this spring. He will continue serving on the Board through June 2017 (in person or by teleconference).

Both Division 4 IASCD Director Richard Kunau and President Tillotson have been notified of the pending vacancy, as has the Governor's Office. Director Kunau is recruiting potential commissioner candidates and will submit a letter of recommendation directly to the Governor's Office by mid-April. In addition, staff has notified districts and posted information about the vacancy on the Commission website and Facebook page. We are hopeful an appointment will be made by the Governor by the end of June.

In addition, Chairman Wright's position is up for reappointment at the end of June, as well. Chairman Wright has indicated he wishes to be reappointed and IASCD's President Tillotson (also Division 5 director) will send the Governor's Office a letter of recommendation.

### ACTIVITIES

- Attended 2017 Ag Summit, along with Commissioners. Asked to serve as Co-Chair of Ag Summit in FY 2018 and 19.
- Recruited and filled North Idaho Water Quality Resource Conservationist position.
- Served as subject matter judge for Leadership Idaho Agriculture presentations on Federal Lands Management.
- Attended Idaho Sage-Steppe Mitigation Program Stakeholder meetings with OSC, other state and federal agency heads.
- Attended NRCS Technical Committee meeting.
- Met with Curtis Elke and Bruce Sandoval (NRCS), Brian Oakey (ISDA), to discuss Emergency Watershed Program re flooding in Cassia County and elsewhere.
- Attended Rock Creek Advisory Board meeting and U of I Livestock Grazing on Public Lands meeting and participated in monthly NASCA Board Meeting.
- The State of Oregon has agreed to send a person to attend the NASCA Board Retreat on my behalf in May. I have done a significant amount of travel this year and feel sitting this one out is prudent.
- Staff attended IASCD Division (3, 4, 5, 6) Delwyne Trefz attended all meetings and I attended Division 3 this year (due to scheduling conflicts on the others - JFAC, Sage-Steppe meetings, and this meeting.). Delwyne Trefz and Commissioner Slichter will attend the Division 1 meeting on the 14<sup>th</sup> of April.



**IDAHO SOIL & WATER  
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- House Bill 133, the Joint Finance and Appropriation Committee’s legislation to change the Commission’s statutory requirement for an annual independent audit to a periodic management review was signed into law by the Governor on March 24, 2017. The Legislative Services Office plans to conduct the first management review to cover FY 2013 – 2017 at a future to be determined date. From that point on, the Commission will be on the rotation list for periodic management reviews along with all other state agencies.
- House Bill 296, the Commission’s Appropriation Bill for FY 2018 has been passed by the House and Senate. By the time of your meeting, it should have been signed into law by the Governor.

TENTATIVE COMMISSION MEETING SCHEDULE

The remaining FY 2017 Regular Commission tentative meeting dates and locations are as follows:

<b>Date &amp; Time</b>	<b>Meeting, Location</b>	<b>Meeting Type</b>
May 11, 8:00 am	Regular meeting/322 E. Front Street, Suite 560, Boise (teleconference to be initiated in Boise)	In person
June 9, 8:00	Regular meeting, 322 E. Front Street, Suite 560, Boise	In person
June 10, CANCELLED	Joint Board Meeting with IASCD (their meeting will be held in No. Idaho, not Boise)	N/A

Should there be important business to conduct, the Chairman may elect to call a special meeting via teleconference for its consideration.

ENVIROTHON

**International** Your Board pledged \$6,000 to the National Conservation Fund’s (NCF) International Envirothon 2018 to be held in Pocatello. As of last July, that pledge has been fully satisfied:

June 2016	\$4,500 pd to Caribou for NCF Envirothon 2018
July 2016	\$1,500 pd to East Side for NCF Envirothon 2018
Total to date	\$6,000

No further donations are scheduled to be made, however, the Envirothon is still fundraising and needs additional contributions. Should we end the year with a surplus of operating funds, staff would like your Board to authorize the administrator’s consideration of an additional donation.



**IDAHO SOIL & WATER  
CONSERVATION COMMISSION**

**State** In addition, since 2015, your Board has donated the following amounts to the Idaho Envirothon:

July 2015	\$1,500 to Bear Lake for Idaho Envirothon 2016
<u>July 2016</u>	<u>\$1,500 to Caribou for Idaho Envirothon 2017</u>
Total to date	\$3,000

Your Board annually considers awarding six capacity building funding requests (1 per division). Should both Divisions 5 and 6 each choose to request a regional funding request of \$1,500 to the State or International Envirothons, the Commission may contribute:

To be distributed	Amount	Division
July 2017	\$1,500	6
July 2017	\$1,500	5
July 2018	\$1,500	6
<u>July 2018</u>	<u>\$1,500</u>	<u>5</u>
Total	\$6,000	

Should these be requested and funded, the Commission will have donated a total of \$12,000 to Envirothon over the last four years.

Staff recommends that your Board directs consideration of making an additional donation of up to \$3,000 should funding permit in the end of FY 2017. This would be in addition to the capacity building requests noted above.

**ACTION:** Direct staff to consider and make an additional donation of up to \$3,000 to the Idaho NCF International Envirothon should there be a surplus of operating funds at the end of FY 2017.

**ATTACHMENTS:**

Gier Letter of Resignation

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RECEIVED

MAR 17 2017

IDAHO SOIL & WATER  
CONSERVATION COMMISSION

March 16, 2017

H. Norman Wright  
1105 Falls Ave.  
American Falls, Idaho 83211

Dear Mr. Wright,

I will be moving to Arizona later this year, and will not be able to finish my term on the State Soil and Water Conservation Commission. I should be able to serve till July 1, 2017.

I had a wonderful experience working with the Commission Board; will cherish it for years to come. We have an excellent staff working for the Commission; they make the Commission Board's work very enjoyable.

Best regards,



Glen R. Gier  
557 Smithwick Road  
Twin Falls, ID 83301

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**IDAHO SOIL & WATER  
CONSERVATION COMMISSION**

Item # 4c

**TO: CHAIRMAN WRIGHT AND COMMISSIONERS RADFORD, GIER, SLICHTER, AND TREBESCH**  
**FROM: RHONDA YADON, FISCAL & HR MANAGER**  
**DATE: APRIL 6, 2017**  
**RE: FINANCIAL REPORTS, FISCAL MATTERS**

**FINANCIAL REPORTS**

Attached for your review is the Financial Detail Reports as of January 31, 2017 and February 28, 2017. The reports for the month ending March 31, 2017, including the financial projections for the remainder of the year, will be available for your review at your meeting. As of February, in Operating Expenditures for the general fund, we have spent 80% of our budget (due to several large annual and semi-annual billings in the first quarter of the fiscal year), and we are only 67% through the year. We should end the year very close to budget as the projected expenditures for March through June is only approximately 16% of budget. Overall, I believe that we are in good financial standing. I will review these reports on all the funds at your meeting and will answer any questions you have.

**NEW HIRES AND VACANCIES**

Effective February 20, 2017, Brad Shelton was hired as the replacement for our Coeur d’Alene office. The Boise position of Technical Records Specialist 2 is vacant. We will look at filling it after the start of Fiscal Year 2018.

**CHANGE IN FAIR LABOR STANDARDS ACT (FLSA) EFFECTIVE DECEMBER 1, 2016**

The change in the federal FLSA that was set to raise the threshold of wages eligible for time and a half overtime rates, thereby reducing the vacation accrual rates on certain employees effective December 1, 2016, has been put on hold.

The court in Nevada v. United States Department of Labor, Civil Action No. 4:16-CV-00731, 2016 U.S. Dist. LEXIS 162048, issued a nationwide preliminary injunction on implementation of the U.S. Department of Labor’s new overtime rule. The case was heard on November 22, 2016. On February 22, 2017, the U.S. Court of Appeals granted a request by the Department of Justice for an extension of time until May 1, 2017 to file its reply brief. In the meantime as the budget allows, we will continue to bring the employees affected by this possible change up to a salary that will allow them to remain in exempt status.

**COMMISSIONER HONORARIUMS**

Below is a schedule of the honorarium balances as of March 31, 2017. Included in the schedule is the days and amounts budgeted for each Commissioner for FY17. We have spent 48.1% of the Honorarium Budget. We are also in good standing with the Operating Travel Budget for Commissioners as we have only spent 52.2% of the allocation as of February 28, 2017. I will update you with the March percent spent at your meeting.

Commissioner	Days Budgeted/ Traveled to Date	Benefit Costs included in Honorariums	Honorariums Budgeted	Expended to Date	Projected Balance/ (Overage)
Wright	26 / 21	\$104	\$1,404	\$1,132	\$272
Gier	20 / 9	\$80	\$1,080	\$484	\$596
Trebesch	20 / 6	\$80	\$1,080	\$323	\$757
Radford	22 / 9	\$88	\$1,188	\$484	\$704
Slichter	24 / 9	\$96	\$1,296	\$484	\$812
Totals		\$450	\$6,050	\$2,909	\$3,141

**RECOMMENDED ACTION:** Approve the Detail Financial Report for the month ended January 31, 2017  
 Approve the Detail Financial Report for the month ended February 28, 2017  
 Approve the March 31, 2017 Financial Reports

**Attachments:** SWC Detail Financial Reports as of January 31, 2017 and February 28, 2017

**SWC DETAIL FINANCIAL REPORT AS OF January 31, 2017**

GENERAL FUND	PERSONNEL			OPERATING			CAPITAL OUTLAY			TRUSTEE & BENEFITS			CASH			
FY17	BUDGET	ACTUAL EXPENSE Thru End of Current Month	BALANCE	BUDGET	ACTUAL EXPENSE Thru End of Current	BALANCE	BUDGET	ACTUAL EXPENSE Thru End of Current	BALANCE	BUDGET	ACTUAL EXPENSE Thru End of Current Month	BALANCE	BEG CASH AT 7/1/16	PLUS TOTAL REC TO DATE	LESS TOTAL EXP TO DATE	ACTUAL CASH BALANCE End of Current
<b>INDEX</b>																
7101 MANAGEMENT ADMIN	360,800	180,454	180,346	45,430	32,249	13,181	11,881	11,881	0				418,111	139	224,584	193,666
7111 MANAGEMENT BOARD	6,000	1,746	4,254	11,965	4,542	7,423							17,965		6,288	11,677
7201 FIELD STAFF	442,400	286,464	155,936	60,289	47,628	12,661	23,600	22,506	1,094				526,289		356,598	169,691
7301 PROGRAMS	257,800	128,107	129,693	31,930	20,758	11,172							289,730		148,865	140,866
7310 DISTRICT ALLOCATIONS										1,103,200	1,103,200	0	1,103,200		1,103,200	0
7320 DISTRICT CAPACITY BLDG										150,000	150,000	0	150,000		150,000	0
7350 CREP	134,000	83,142	50,858	23,606	18,458	5,148	23,600	22,669	931				181,206		124,269	56,937
<b>TOTAL GENERAL FUND 0001</b>	<b>1,201,000</b>	<b>679,913</b>	<b>521,087</b>	<b>173,220</b>	<b>123,635</b>	<b>49,585</b>	<b>59,081</b>	<b>57,056</b>	<b>2,025</b>	<b>1,253,200</b>	<b>1,253,200</b>	<b>0</b>	<b>2,686,501</b>	<b>139</b>	<b>2,113,804</b>	<b>572,836</b>
<b>FY16 ENCUMBRANCES</b>				<b>2,110</b>	<b>1,920</b>	<b>190</b>	<b>27,850</b>	<b>27,850</b>	<b>0</b>						<b>29,770</b>	
		56.61%			71.37%			96.57%			100.00%				78.68%	
7313 DISTRICT ECON RECOVERY										100,000	100,000	0	100,000		100,000	0
<b>TOTAL FUND 0150</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100,000</b>	<b>100,000</b>	<b>0</b>	<b>100,000</b>	<b>0</b>	<b>100,000</b>	<b>0</b>
											100.00%				100.00%	
7325 SWC PROFESSIONAL SERV				30,000	378	29,622							30,149	142	378	29,913
<b>TOTAL FUND 0450</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30,000</b>	<b>378</b>	<b>29,622</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30,149</b>	<b>142</b>	<b>378</b>	<b>29,913</b>
<b>FY16 ENCUMBRANCES</b>				<b>14,689</b>	<b>0</b>	<b>14,689</b>										
					1.26%										1.25%	
DEDICATED FUND	PERSONNEL			OPERATING			CAPITAL OUTLAY			CASH				BALANCE SHEET		
FY17	BUDGET	ACTUAL EXPENSE thru End of Current Month	BALANCE	BUDGET	ACTUAL EXPENSE Thru End of Current	BALANCE	BUDGET	ACTUAL EXPENSE Thru End of Current	BALANCE	BEG CASH AT 7/1/16	PLUS TOTAL REC TO DATE	LESS TOTAL EXP TO DATE	ACTUAL CASH BALANCE End of Current	NOTES RECEIVABLE 7/1/16	LOANS PAID OUT, COLLECTIONS /ADJUSTMENTS TO DATE	NOTES RECEIVABLE End of Cur period
7351 RCRDP LOAN ADMIN	166,500	93,613	72,887	145,500	46,343	99,157				6,902,717	621,865	613,401	6,911,181	2,960,216	473,432	2,908,381
<b>TOTAL RCRDP ADMIN 0522-01</b>	<b>166,500</b>	<b>93,613</b>	<b>72,887</b>	<b>145,500</b>	<b>46,343</b>	<b>99,157</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6,902,717</b>	<b>621,865</b>	<b>613,401</b>	<b>6,911,181</b>		(525,267)	
		56.22%			31.85%							8.89%				
7361 REVOLVING LOAN - DEQ				30,000	1,886	28,114				37,346	12,763	1,886	48,223	494,587	0	430,006
<b>TOTAL DEQ LOAN 0529-16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30,000</b>	<b>1,886</b>	<b>28,114</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37,346</b>	<b>12,763</b>	<b>1,886</b>	<b>48,223</b>		(64,581)	
					6.29%							5.05%		<b>ADV FROM PAYMENTS/ADJ TO DATE</b>	<b>ADV FROM TO DATE</b>	<b>END OF CUR PERIOD</b>
														438,418	(64,009)	374,409

**SWC DETAIL FINANCIAL REPORT AS OF February 28, 2017**

GENERAL FUND	PERSONNEL			OPERATING			CAPITAL OUTLAY			TRUSTEE & BENEFITS			CASH			
FY17	ACTUAL EXPENSE Thru End of Current Month			ACTUAL EXPENSE Thru End of			ACTUAL EXPENSE Thru End of			ACTUAL EXPENSE Thru End of Current Month			PLUS TOTAL			ACTUAL CASH BALANCE
	BUDGET	Month	BALANCE	BUDGET	Current	BALANCE	BUDGET	Current	BALANCE	BUDGET	Month	BALANCE	BEG CASH AT 7/1/16	REC TO DATE	LESS TOTAL EXP TO DATE	End of Current
<b>INDEX</b>																
7101 MANAGEMENT ADMIN	360,800	208,652	152,148	45,430	44,527	903	12,131	11,881	250				418,361	139	265,060	153,440
7111 MANAGEMENT BOARD	6,000	2,085	3,915	11,965	5,573	6,392							17,965		7,658	10,307
7201 FIELD STAFF	442,400	317,094	125,306	60,289	49,030	11,259	23,600	22,506	1,094				526,289		388,630	137,659
7301 PROGRAMS	257,800	144,854	112,946	31,930	21,140	10,790							289,730		165,994	123,737
7310 DISTRICT ALLOCATIONS										1,103,200	1,103,200	0	1,103,200		1,103,200	0
7320 DISTRICT CAPACITY BLDG										150,000	150,000	0	150,000		150,000	0
7350 CREP	134,000	93,405	40,595	23,606	18,708	4,898	23,600	22,669	931				181,206		134,782	46,424
<b>TOTAL GENERAL FUND 0001</b>	<b>1,201,000</b>	<b>766,090</b>	<b>434,910</b>	<b>173,220</b>	<b>138,978</b>	<b>34,242</b>	<b>59,331</b>	<b>57,056</b>	<b>2,275</b>	<b>1,253,200</b>	<b>1,253,200</b>	<b>0</b>	<b>2,686,751</b>	<b>139</b>	<b>2,215,324</b>	<b>471,566</b>
<b>FY16 ENCUMBRANCES</b>				<b>2,110</b>	<b>1,920</b>	<b>190</b>	<b>27,850</b>	<b>27,850</b>	<b>0</b>						<b>29,770</b>	
		<b>63.79%</b>			<b>80.23%</b>			<b>96.17%</b>			<b>100.00%</b>				<b>82.45%</b>	
7313 DISTRICT ECON RECOVERY										100,000	100,000	0	100,000		100,000	0
<b>TOTAL FUND 0150</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100,000</b>	<b>100,000</b>	<b>0</b>	<b>100,000</b>	<b>0</b>	<b>100,000</b>	<b>0</b>
															<b>100.00%</b>	
7325 SWC PROFESSIONAL SERV				30,000	378	29,622							30,149	165	378	29,936
<b>TOTAL FUND 0450</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30,000</b>	<b>378</b>	<b>29,622</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30,149</b>	<b>165</b>	<b>378</b>	<b>29,936</b>
<b>FY16 ENCUMBRANCES</b>				<b>14,689</b>	<b>0</b>	<b>14,689</b>										
					<b>1.26%</b>										<b>1.25%</b>	
DEDICATED FUND	PERSONNEL			OPERATING			CAPITAL OUTLAY			CASH				BALANCE SHEET		
FY17	ACTUAL EXPENSE thru End of Current Month			ACTUAL EXPENSE Thru End of			ACTUAL EXPENSE Thru End of			PLUS TOTAL			ACTUAL CASH BALANCE	LOANS PAID OUT, NOTES RECEIVABLE		NOTES RECEIVABLE
	BUDGET	Month	BALANCE	BUDGET	Current	BALANCE	BUDGET	Current	BALANCE	BEG CASH AT 7/1/16	REC TO DATE	LESS TOTAL EXP TO DATE	End of Current	NOTES RECEIVABLE 7/1/16	COLLECTIONS /ADJUSTMENTS TO DATE	End of Cur period
7351 RCRDP LOAN ADMIN	166,500	105,579	60,921	145,500	56,256	89,244				6,902,717	659,935	635,281	6,927,371	2,960,216	473,433	2,890,444
<b>TOTAL RCRDP ADMIN 0522-01</b>	<b>166,500</b>	<b>105,579</b>	<b>60,921</b>	<b>145,500</b>	<b>56,256</b>	<b>89,244</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6,902,717</b>	<b>659,935</b>	<b>635,281</b>	<b>6,927,371</b>		(543,205)	
		<b>63.41%</b>			<b>38.66%</b>							<b>9.20%</b>				
7361 REVOLVING LOAN - DEQ				30,000	1,886	28,114				37,346	12,798	1,886	48,258	494,587	0	430,006
<b>TOTAL DEQ LOAN 0529-16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30,000</b>	<b>1,886</b>	<b>28,114</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37,346</b>	<b>12,798</b>	<b>1,886</b>	<b>48,258</b>		(64,581)	
					<b>6.29%</b>							<b>5.05%</b>				
														<b>ADV FROM PAYMENTS/ADJ TO DATE</b>	<b>ADV FROM TO DATE</b>	<b>END OF CUR PERIOD</b>
														438,418	(64,009)	374,409

**SWC DETAIL FINANCIAL REPORT AS OF March 31, 2017**

GENERAL FUND	PERSONNEL			OPERATING			CAPITAL OUTLAY			TRUSTEE & BENEFITS			CASH			
	ACTUAL EXPENSE Thru End of Current			ACTUAL EXPENSE Thru End of Current			ACTUAL EXPENSE Thru End of Current			ACTUAL EXPENSE Thru End of Current			BEG CASH AT 7/1/16	PLUS TOTAL REC TO DATE	LESS TOTAL EXP TO DATE	ACTUAL CASH BALANCE End of Current
FY17	BUDGET	Month	BALANCE	BUDGET	Current	BALANCE	BUDGET	Current	BALANCE	BUDGET	Month	BALANCE				
<b>INDEX</b>																
7101 MANAGEMENT ADMIN	360,800	236,767	124,033	54,230	40,693	13,537	12,793	11,881	912				427,823		289,341	138,482
7111 MANAGEMENT BOARD	6,000	2,618	3,382	9,565	8,213	1,352							15,565		10,831	4,734
7201 FIELD STAFF	442,400	349,867	92,533	60,289	52,119	8,170	23,206	22,900	306				525,895		424,886	101,009
7301 PROGRAMS	257,800	164,144	93,656	25,530	21,701	3,829							283,330		185,845	97,486
7310 DISTRICT ALLOCATIONS										1,103,200	1,103,200	0	1,103,200		1,103,200	0
7320 DISTRICT CAPACITY BLDG										150,000	150,000	0	150,000		150,000	0
7350 CREP	134,000	103,664	30,336	23,606	20,591	3,015	23,332	22,938	394				180,938		147,193	33,745
<b>TOTAL GENERAL FUND 0001</b>	<b>1,201,000</b>	<b>857,060</b>	<b>343,940</b>	<b>173,220</b>	<b>143,317</b>	<b>29,903</b>	<b>59,331</b>	<b>57,719</b>	<b>1,612</b>	<b>1,253,200</b>	<b>1,253,200</b>	<b>0</b>	<b>2,686,751</b>	<b>0</b>	<b>2,311,296</b>	<b>375,455</b>
<b>FY16 ENCUMBRANCES</b>				<b>2,110</b>	<b>1,920</b>	<b>190</b>	<b>27,850</b>	<b>27,850</b>	<b>0</b>						<b>29,770</b>	
		<b>71.36%</b>			<b>82.74%</b>			<b>97.28%</b>			<b>100.00%</b>				<b>86.03%</b>	
7313 DISTRICT ECON RECOVERY										100,000	100,000	0	100,000		100,000	0
<b>TOTAL FUND 0150</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100,000</b>	<b>100,000</b>	<b>0</b>	<b>100,000</b>	<b>0</b>	<b>100,000</b>	<b>0</b>
											<b>100.00%</b>				<b>100.00%</b>	
7325 SWC PROFESSIONAL SERV				30,000	378	29,622							30,149	188	378	29,959
<b>TOTAL FUND 0450</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30,000</b>	<b>378</b>	<b>29,622</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30,149</b>	<b>188</b>	<b>378</b>	<b>29,959</b>
<b>FY16 ENCUMBRANCES</b>				<b>14,689</b>	<b>0</b>	<b>14,689</b>										
					<b>1.26%</b>										<b>1.25%</b>	
<b>DEDICATED FUND</b>	<b>PERSONNEL</b>			<b>OPERATING</b>			<b>CAPITAL OUTLAY</b>			<b>CASH</b>				<b>BALANCE SHEET</b>		
	ACTUAL EXPENSE thru End of Current			ACTUAL EXPENSE Thru End of Current			ACTUAL EXPENSE Thru End of Current			ACTUAL CASH BALANCE End of Current			LOANS PAID OUT, NOTES RECEIVABLE			
FY17	BUDGET	Month	BALANCE	BUDGET	Current	BALANCE	BUDGET	Current	BALANCE	BEG CASH AT 7/1/16	PLUS TOTAL REC TO DATE	LESS TOTAL EXP TO DATE	End of Current	NOTES RECEIVABLE 7/1/16	COLLECTIONS /ADJUSTMENTS TO DATE	NOTES RECEIVABLE End of Cur period
7351 RCRDP LOAN ADMIN	166,500	117,566	48,934	144,838	60,955	83,883	662	662	0	6,902,717	733,260	675,689	6,960,288	2,960,216	496,494	2,848,193
<b>TOTAL RCRDP ADMIN 0522-01</b>	<b>166,500</b>	<b>117,566</b>	<b>48,934</b>	<b>144,838</b>	<b>60,955</b>	<b>83,883</b>	<b>662</b>	<b>662</b>	<b>0</b>	<b>6,902,717</b>	<b>733,260</b>	<b>675,689</b>	<b>6,960,288</b>		(608,517)	
		<b>70.61%</b>			<b>42.08%</b>			<b>100.00%</b>				<b>9.79%</b>				
7361 REVOLVING LOAN - DEQ				30,000	1,886	28,114				37,346	12,837	1,886	48,297	494,587	0	430,006
<b>TOTAL DEQ LOAN 0529-16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30,000</b>	<b>1,886</b>	<b>28,114</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37,346</b>	<b>12,837</b>	<b>1,886</b>	<b>48,297</b>		(64,581)	
					<b>6.29%</b>							<b>5.05%</b>				
														<b>ADV FROM PAYMENTS/ADJ TO DATE</b>	<b>END OF CUR PERIOD</b>	
														438,418	(64,009)	374,409

## Soil and Water Conservation FY2017 YTD Financial Summary Through March 31, 2017

(Does not include FY2016 encumbrances)

Updated: 4/10/2017

### Fund Summaries

### Appropriation

Fund Source	General Fund				Professional Services				RCRDP Loan Administration				Revolving Loan			
<b>Personnel Funds</b>	Budget	Expenditures	Expenditures Projected	Remaining					Budget	Expenditures	Expenditures Projected	Remaining				
	\$ 1,201,000	\$ 857,059	\$ 313,723	\$ 30,218					\$ 166,500	\$ 117,566	\$ 43,418	\$ 5,516				
<b>Operating Funds</b>	Budget	Expenditures	Expenditures Projected	Remaining	Budget	Expenditures	Expenditures Projected	Remaining	Budget	Expenditures	Expenditures Projected	Remaining	Budget	Expenditures	Expenditures Projected	Remaining
	* \$ 173,220	\$ 143,317	\$ 21,999	\$ 7,904	\$ 30,000	\$ 378	\$ 8,655	\$ 20,967	* \$ 144,838	\$ 60,955	\$ 37,623	\$ 46,260	\$ 30,000	\$ 1,886	\$ 5,000	\$ 23,114
<b>Capital Funds</b>	Budget	Expenditures	Expenditures Projected	Remaining					Budget	Expenditures	Expenditures Projected	Remaining				
	* \$ 59,331	\$ 57,719	\$ -	\$ 1,612					* \$ 662	\$ 662	\$ -	\$ -				
<b>Trustee and Benefit</b>	Budget	Expenditures	Expenditures Projected	Remaining												
	\$ 1,253,200	\$ 1,253,200	\$ -	\$ -												

\* Requested \$4,281 to Roll Down to Pay for New Cubicles

\* Requested \$662 to Roll Down to Pay for Half of Receptionist Cubicle

### Cash Balance at 03/31/17

Fund Source	General Fund				Professional Services				RCRDP Loan Administration				Revolving Loan			
	Beg Cash at 7/1/16	Plus Total Receipts	Less Total Expenses	Actual Cash balance	Beg Cash at 7/1/16	Plus Total Receipts	Less Total Expenses	Actual Cash balance	Beg Cash at 7/1/16	Plus Total Receipts	Less Total Expenses	Actual Cash balance	Beg Cash at 7/1/16	Plus Total Receipts	Less Total Expenses	Actual Cash balance
	\$ 2,686,751	\$ -	\$ 2,311,296	\$ 375,455	\$ 30,149	\$ 188	\$ 378	\$ 29,959	#####	\$ 733,260	\$ 675,689	\$ 6,960,288	\$ 37,346	\$ 12,837	\$ 1,886	\$ 48,297



IDAHO SOIL & WATER  
CONSERVATION COMMISSION

Item # 4d

**TO: CHAIRMAN WRIGHT AND COMMISSIONERS RADFORD, SLICHTER, GIER, AND TREBESCH**  
**FROM: TERI MURRISON, ADMINISTRATOR**  
**DATE: March 28, 2017**  
**RE: DRAFT FY 2018-2021 STRATEGIC PLAN**

The Commission is required by statute to submit an updated and adopted Strategic Plan by July 1<sup>st</sup> every year to serve as a guidance document for the agency over succeeding four years. Given that the past few years integrated significant changes, this year's draft has been slightly modified to address comments on last year's Plan by the Board of the Nez Perce SWCD (NPSWCD), and to add additional tasks and remove completed tasks (identified by Track Changes in the attached draft Plan).

With regard to NPSWCD comments in the attached letter, the word volunteer has been deleted (Page 3, Core Function 1), the referred to 3<sup>rd</sup> Core Function (Page 3) has been replaced by "Outreach and Education" (it's not typical for state agencies to include administrative goals in Strategic Plans), and the words regarding discretionary time have been replaced with "[include](#) reasonable/flexible [amount of](#) discretionary time" which is a clearer way to state the objective. The final comments regarding work plan deliverables were not addressed since the Strategic Plan does not incorporate a work plan for Board consideration.

After your review, a copy of the attached Draft Strategic Plan can be further amended before being distributed to the Strategic Plan District & Partner Review Committee (Steve Becker, Art Beal, Dennis Tanikuni, Benjamin Kelly, and Chris Simons). Once they have suggested changes and commented, staff will return the draft to your Board for further direction at the May meeting.

Districts will receive a final draft of the revised Strategic Plan after your meeting in May and will be asked to comment and make suggestions. Final adoption of the Plan will take place at your June meeting. The Board is required to adopt the Strategic Plan at your June meeting to meet the July 1, 2017 deadline.

RECOMMENDED ACTION: For information only

Attachments:

- Draft FY 2018-2021 ISWCC Strategic Plan
- Nez Perce SWCD FY 2016 Comment Letter

# FY 2018-2021 Strategic Plan

*Conservation the Idaho Way: sowing seeds of stewardship*



Idaho Soil & Water  
Conservation  
Commission

322 E Front St, Suite 560  
Boise, Idaho 83702  
208-332-1790  
[www.swc.idaho.gov](http://www.swc.idaho.gov)



SOIL & WATER  
CONSERVATION COMMISSION

*Conservation the Idaho Way: Sowing the Seeds of Stewardship*

## CONSERVATION THE IDAHO WAY

Idaho is endowed with a magnificent blend of diverse natural landscapes -- rivers, lakes, mountains, forests and desert canyons -- combined with rich and fertile agricultural lands well suited for growing a wide variety of crops and raising livestock. People who work in Idaho agriculture have deep roots in the land. They know that caring for the land will reap benefits for future generations.

"Conservation the Idaho Way" reflects the conviction that the very best way to care for and enhance the soil, water, air, plants and wildlife is through voluntary, locally led efforts. We use the state's natural resources to benefit Idahoans while maintaining and improving natural resources for future generations.

## MISSION

We facilitate coordinated non-regulatory, voluntary, and locally-led conservation by federal, state, and local governments including Idaho's conservation districts and other partners to conserve, sustain, improve, and enhance soil, water, air, plant, and animal resources. (IC 27:22)

## SLOGAN

Conservation the Idaho Way: sowing seeds of stewardship

## VISION

Conservation in Idaho reflects locally-led natural resource conservation leadership and priorities, is voluntary and incentive-based, non-regulatory, and demonstrates scientifically sound stewardship. The Conservation Commission and local conservation districts are the primary entities to lead coordinated conservation efforts with partners to provide landowners and land-users with assistance and solutions for natural resource concerns and issues.

## GUIDING PRINCIPLES

- Address legislative intent and statute
- Benefit the environment and Idaho's agricultural-based economy
- Benefit conservation districts' locally led, voluntary, non-regulatory priorities and projects
- Benefit the Commission's ability to serve and meet statutory authorities
- Promote fiscal responsibility
- Strengthen existing and build new conservation partnerships
- Incorporate valid scientific data and practices
- Benefit conservation work on natural resource priority issue area
- Promote innovative conservation measures

*Conservation the Idaho Way: Sowing the Seeds of Stewardship*

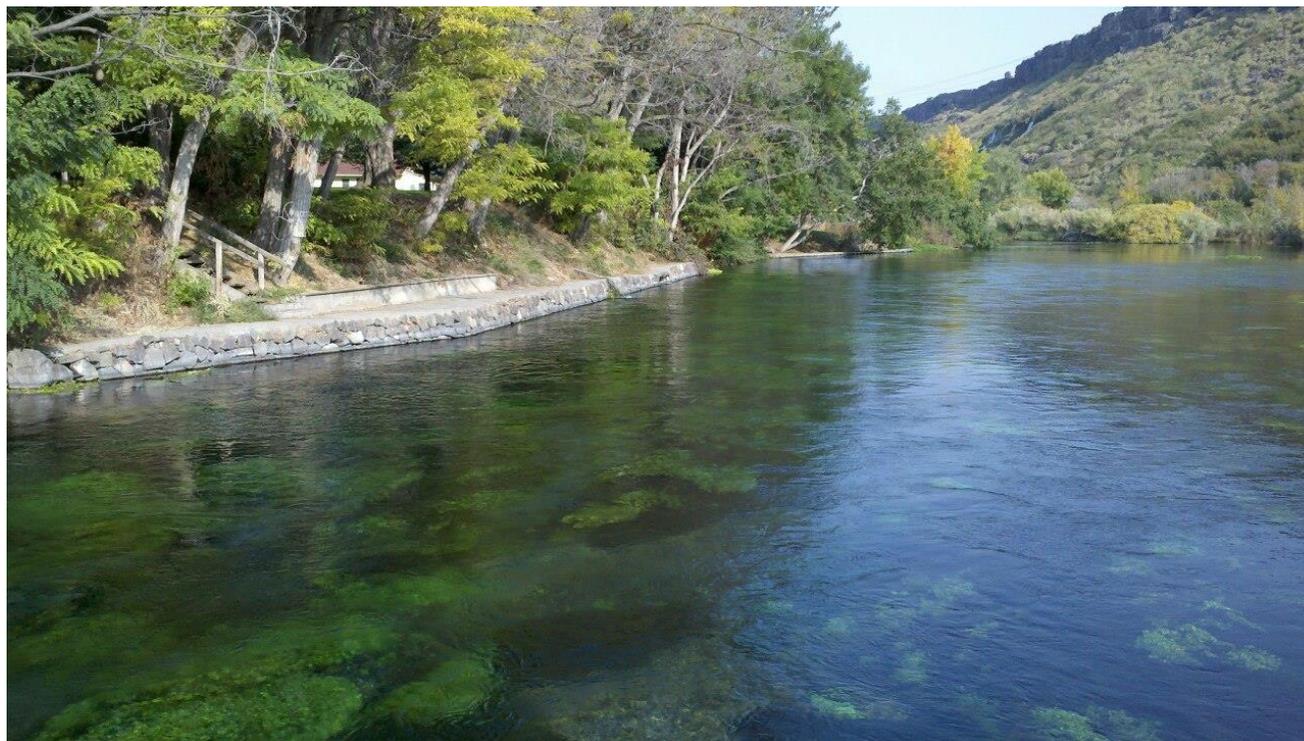


## CORE FUNCTIONS

The Conservation Commission focuses on three core functions:

1. Providing support to Idaho's 50 locally-led, ~~volunteer~~ conservation districts.
2. Providing incentive-based and general conservation programs and services.

~~3. Supporting services and programs in a fiscally prudent, inclusive, and transparent manner. Conduct outreach and communications to educate/inform public, decision makers, partners, and other stakeholders~~



## KEY EXTERNAL FACTORS

There are key external factors that could affect the agency's ability to meet the goals and objectives contained in this Strategic Plan. They include:

- Changing demographics and land use designations.
- State and federal regulatory pressure and mandates that could shift priorities and resources away from current activities.
- Changing economics and pressures of agricultural and natural resources dependent industries which could result in significant increases or decreases in conservation program participation.
- Changing economics of state and federal budgets, which could result in additional agency cuts or fewer conservation dollars available to be spent in the state.

*Conservation the Idaho Way: Sowing the Seeds of Stewardship*



## CORE FUNCTIONS &amp; KEY PERFORMANCE MEASURES

GOALS	OBJECTIVES	KEY PERFORMANCE MEASURES	FY 2017-2018 BENCHMARKS
1. Support Districts' voluntary conservation efforts	Provide districts w/technical and capacity building assistance	<ul style="list-style-type: none"> <li>Conduct annual survey to identify satisfaction with services &amp; programs</li> </ul>	<ul style="list-style-type: none"> <li>% of districts satisfied with services &amp; programs               <ul style="list-style-type: none"> <li><del>34%</del>36% strongly agree</li> <li><del>47%</del>46% somewhat agree</li> <li><del>78%</del> neutral</li> <li><del>108%</del> somewhat disagree</li> <li>2% disagree</li> <li>0% N/A</li> </ul> </li> </ul>
		<ul style="list-style-type: none"> <li>Assist in updating 5-Year Plans</li> </ul>	<ul style="list-style-type: none"> <li>50 of 50 district 5-Year Plans updated</li> </ul>
		<ul style="list-style-type: none"> <li>Conduct annual technical &amp; comprehensive assistance request process, assign field staff, <del>including</del>include reasonable/flexible <u>amount of</u> discretionary time</li> </ul>	<ul style="list-style-type: none"> <li>Quantify and track assistance provided               <ul style="list-style-type: none"> <li># of technical assistance hours requested/awarded</li> <li><del>#served</del>serve <u>40 districts</u> with projects</li> <li><del>#initiate</del> <u>50</u> new projects</li> <li><del>#work on</del> <u>75</u> ongoing projects</li> <li><del>#</del><u>245</u> landowners served</li> </ul> </li> </ul>
2. Provide Conservation Programs & Services	Incentive-Based Programs	<b>Resource Conservation &amp; Rangeland Development Program (RCRDP)</b> Make low interest conservation loans	<ul style="list-style-type: none"> <li>Quantify and track:             <ul style="list-style-type: none"> <li><del>#of</del><u>65</u> loan inquiries</li> <li><del>#of</del><u>15</u> new loans</li> <li><del>Total \$ loaned in prior FY</del><u>\$900,000 in new loans</u></li> <li><del>#</del><u>28</u> -applications submitted</li> <li><del>loan applications pending @ end of FY</del></li> <li><del>customers satisfied</del> <u>5</u> loan applications denied or withdrawn</li> </ul> </li> </ul>
		<b>Conservation Reserve Enhancement Program (CREP)</b> Provide technical leadership and oversight to reduce ground water use, improve water quantity and quality, enhance wildlife habitat, and decrease the risk of agriculture-related chemical and sediment runoff in Eastern Snake Plain Aquifer.	<ul style="list-style-type: none"> <li>Quantify &amp; track:             <ul style="list-style-type: none"> <li><del>#</del><u>160</u> contracts</li> <li><del>#of</del><u>22,000 total</u> acres</li> <li><del>#</del><u>10</u> contracts certified (achieving program goals)</li> <li><del>#</del><u>1,500</u> certified acres</li> <li><del>water conserved</del></li> </ul> </li> </ul>

## FY 2018-2021 Strategic Plan

GOALS	OBJECTIVES	KEY PERFORMANCE MEASURES	BENCHMARKS
	<b>General Conservation Programs &amp; Services</b>	<b>Total Maximum Daily Load (TMDL) Implementation Planning Program</b> – subject to DEQ priorities, write plans/ designated lead for voluntary ag/grazing projects on listed/impaired waterways	<ul style="list-style-type: none"> <li>▪ Quantify &amp; track:               <ul style="list-style-type: none"> <li>▪ # of new plans assigned by DEQ</li> <li>▪ <del>#7</del> plans completed</li> <li>▪ <del>#15</del> in progress</li> <li>▪ <del>#18</del> pending</li> </ul> </li> </ul>
		<b>Ground Water Quality/Nitrate Priority Areas</b> - Facilitate cooperative ground water protection, promote and support implementation of water quality projects to maintain and enhance ground water quality	<ul style="list-style-type: none"> <li>▪ Quantify &amp; track:               <ul style="list-style-type: none"> <li>▪ <del>#42,000</del> acres treated</li> <li>▪ <del>140,000#s</del> <del>Nitrates-nitrates</del> reduced (<del>#s</del>)</li> <li>▪ <del>28,000#</del> <del>Phosphorus-phosphorus</del> reduced (<del>#s</del>)</li> <li>▪ <del>150,000 tons</del> <del>s</del> Sediments reduced (tons)</li> </ul> </li> </ul>
<b>3. Build Support for Voluntary Conservation</b>	<b>Conduct outreach and communication</b> educate/inform public, decision makers, partners, and other stakeholders	Maintain Facebook & Twitter content about voluntary conservation activities of Commission and districts	<ul style="list-style-type: none"> <li>▪ Quantify:               <ul style="list-style-type: none"> <li>▪ <del># of Facebook friends</del> <del>26</del> <del>average page views</del></li> <li>▪ <del># of Twitter followers</del> <del>33</del> <del>average hits per day</del></li> <li>▪ <del>1,100,000</del> <del>annual total hits</del></li> <li>▪ <del>275</del> <del>Facebook posts</del></li> <li>▪ <del>50,000</del> <del>reached with posts</del></li> <li>▪ <del>200</del> <del>new page likes</del></li> <li>▪ <del>75</del> <del>tweets on Twitter</del></li> <li>▪ <del>12,000</del> <del>Twitter impressions</del></li> <li>▪ <del>800</del> <del>profile vieqws</del></li> <li>▪ <del>200</del> <del>new followers</del></li> <li>▪ <del>675</del> <del>newsletter subscriptions</del></li> </ul> </li> </ul>
		Publish monthly newsletter about voluntary conservation activities of Commission and districts	<ul style="list-style-type: none"> <li>▪ Quantify # of subscriptions</li> </ul>
		Co-produce video on <del>Envirothon with Idaho Rangeland Resource Commission</del> <del>Commission and district accomplishments for 2018</del> <del>Legislative Session, funding permitting</del>	<ul style="list-style-type: none"> <li>• 1 7-9 minute video about <del>the Idaho Envirothon competition for use in legislative and other presentations in FY 2017</del> <del>Commission and district accomplishments, funding permitting</del></li> <li>• Present to 5 germane legislative committees</li> </ul>

*Conservation the Idaho Way: Sowing the Seeds of Stewardship*



# FY 2018-2021 Strategic Plan

*Conservation the Idaho Way: sowing seeds of stewardship*

C.L. "Butch" Otter, Governor

## Board

H. Norman Wright, Chairman

Gerald Trebesch, Vice Chair

Leon Slichter, Secretary

Dave Radford, Member

Glen Gier, Member

Teri Murrison, Administrator

## **Idaho Soil & Water Conservation Commission**

650 W. State Street, Rm. 145

Boise, ID 83702

208-332-1790

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*Conservation the Idaho Way: Sowing the Seeds of Stewardship*



SOIL & WATER  
CONSERVATION COMMISSION

Chairman Wright  
650 W. State St. Room 145  
Boise, ID 83702

June 8, 2016

Dear Chairman Wright:

The Nez Perce Soil and Water Conservation District believes that function of the Idaho Soil and Water Conservation Commission is the support of soil and water conservation districts (SWCDs), which includes advocating for financial sustainability for all SWCDs in the state of Idaho. Our comments relating to the FY2017 -2020 Strategic Plan are summarized as follows:

Page 3. Core Function 1. Delete the word volunteer. District officials are locally elected officials who serve unpaid. The word volunteer diminishes the authority which they have statutorily been granted. Suggested rewording is "Providing support to Idaho's 50 conservation districts."

Page 3. Core Function 3. Change wording to "Supporting districts and programs in a fiscally prudent, inclusive and transparent manner."

Page 4, line 3 column 3. Delete the words "including reasonable/flexible discretionary time".

Page 11, Objective 2.9. Consider deleting this objective. The NPSWCD does not support commission staff time allocated to providing professional services to other agencies. If there is not sufficient work to support a commission staff position, then perhaps that position should be eliminated. Bottomline, commission dollars need to be invested in SWCDs, not state agencies. Those agencies receive a budgetary allocation. Why should dollars allocated by the state legislature and Idaho Governor's Office be reallocated from SWCDs to other state agencies? Diluting resources available to SWCDs by reallocating those resources to state agencies does not build the capacity of SWCDs. We are concerned that creating an agreement with another agency would cause competing priorities and diminished resources available to SWCDs.

Page 13, Objective 3.3, FY2015 work plan deliverables. Delete provide technical assistance to other agencies (including engineering). This dilutes the resources available for SWCDs. Is the commission being reimbursed for these activities? We do not support the commission providing services, other than incidental, to other agencies. SWCDs are better served by additional funding through commission staff reductions or reassigning staff to SWCDs.

Thank you for the opportunity to comment on your strategic plan. If you have any questions, please contact me at 208.843.2931.

Sincerely,



Steve Becker



IDAHO SOIL & WATER  
CONSERVATION COMMISSION

**Item # 4e**

**TO: CHAIRMAN WRIGHT AND COMMISSIONERS RADFORD, GIER, SLICHTER, AND TREBESCH**  
**FROM: RHONDA YADON, FISCAL & HR MANAGER**  
**DATE: APRIL 5, 2017**  
**RE: FY 2018 APPROPRIATION AND BUDGET BLUEPRINT**

The Governor recently signed House Bill 296, the Commission's FY 2018 Appropriations Bill (see attached). It appropriates \$3,125,900 in FY 2018, and caps ISWCC's full-time authorized positions at 17.75. In addition to adjustments for health care, network, statewide cost allocation and such, the FY 2018 budget provides funding for the replacement of three vehicles. It also funds spending authority for .25 FTP of our Technical Records Specialist 2 (TRS2) to be paid by the NRCS, and a 3% ongoing salary increase for our employees to be distributed based on merit.

The Conservation Commission annually approves a Budget Blueprint for the appropriations of General and Dedicated funds. Attached is a draft FY 2018 Budget Blueprint recommendation for your consideration.

***General Fund Draft Blueprint***

Revenue: Appropriated General Fund revenue in FY 2018 totals \$2,734,900. It includes \$1,207,200 in Personnel funds, \$183,900 in Operating funds, \$90,600 in Capital funds, and \$1,253,200 in Trustee and Benefit funds. FY 2013's additional \$50,000 in Trustee & Benefit funds distributed under the match allocation formula is included as part of the Commission's Base FY 2017 funding, as are FY 2014's \$50,000 and FY 2015's additional \$50,000 (each year), which are allocated to districts equally.

Expenditures: General Fund budgeted expenditures in FY 2018 are forecasted to be \$182,061. Personnel and Capital fund expenditures in FY 2018 equal the appropriated funds. Per Board policy, the draft Blueprint sets aside a modest \$1,839 in Operating funds as a contingency. Under Trustee and Benefit funds, the draft Blueprint allocates \$425,000 for Base funding, \$678,200 for Match formula funding, \$100,000 for Operating, and \$50,000 for Capacity Building funding.

Since the estimated costs are not yet available, the attached draft Blueprint estimates SWCAP expenses (Controller's Office, Attorney General, etc.) to be \$44,200. The draft Blueprint assumes roughly 50/50 cost sharing with the RCRDP fund for overhead expenses including our Memo of Understanding (MOU) with the Department of Administration for IT support.

The General Fund Budget draft Blueprint funds ISWCC staffing at 15.65 FTPs. It assumes some office staff spend .10 of an FTP assisting with RCRDP conservation planning and fiscal activities.

***Dedicated Fund Draft Blueprint***

Revenue: Dedicated Fund revenues are limited to cash on-hand and interest generated by both RCRDP and SRF loans, as well as one fund containing cost recovery for the provision of technical assistance provided to other agencies. In FY 2018, RCRDP cash on-hand is estimated to be no less than \$6,960,171. Estimated interest income on the current loan portfolio will be approximately \$150,800 (not including late interest, new loan activity, or early payoffs' impacts on interest generation). The total RCRDP Dedicated Fund balance will be approximately \$7,068,148 in FY 2018. Cash on-hand at the beginning of FY 2018 in the Technical Cost Recovery fund is projected to be \$9,674. Potential income in that fund is \$20,000, which would bring total funds to \$29,674. Cash on-hand in the SRF Fund is forecast to be \$48,297

and FY 2018 income an additional \$11,858. Total SRF cash on-hand and income generated in FY 2018 are estimated at \$60,155.

Terry Hoebelheinrich prepared the below-referenced estimate of the interest to be generated along with a comparison to last year's interest estimate. He will be available at your meeting to discuss his projection (below):

\$ 91,200	RCRDP (AVG 3.2%)
<u>\$ 6,000</u>	<u>IDLE TREASURY (AVG 0.86%)</u>
\$150,800	TOTAL

We would stress that while interest generated does not yet equal program expenses, continuing to be fiscally cautious while awaiting an upturn in loan activity and interest rates is the prudent course of action. For example, if state treasury rates go up by 1%, that would yield an approximate increase of interest income approaching \$45,000.

Expenditures: Expenditures assume that the income identified in Revenues materializes, but if not, expenditures are estimated to equal income with the exception of the RCRDP fund. The draft Blueprint assumes that income generated through interest to the RCRDP fund increases, but does not cover the spending authority appropriation. See the attached FY 2018 RCRDP Estimated Interest Income. Loan officer Terry Hoebelheinrich will address that during the discussion of this item.

The RCRDP draft Blueprint assumes 2.10 full time staff persons (loan officer and loan servicing assistant, and .10 of office staff FTP). It also assumes costs incurred for meetings where RCRDP program is discussed or business is conducted will be charged to that fund.

Since the estimated costs are not yet available, the attached draft Blueprint estimates SWCAP expenses (Controller's Office, Attorney General, etc.) to be roughly \$44,200. The draft Blueprint assumes roughly 50/50 cost sharing with the RCRDP fund for overhead expenses including our MOU with the Department of Administration for IT support.

The Budget draft Blueprint for Dedicated Funds assumes the specified income will be realized in Technical Assistance Cost Recovery, however that may not be the case. Cash on-hand on at the beginning of FY 2018 will be approximately \$9,670 and in addition, we may recover up to an additional \$20,000. Regardless, the maximum spending authority in this fund is capped at \$30,000 in FY 2018.

New this year is an on-going appropriation in the Federal Grant Fund of \$17,200 for .25 FTP to fund our TRS2 position by the NRCS.

The budgeted cost in the State Revolving Fund assumes that an amount roughly equal to 10% of the loan officer's salary will be charged to this fund to recoup RCRDP administrative costs. The balance of funds generated through this loan will continue to be held in contingency to build a modest reserve to preserve cash flow in this account should the borrower be late on payments.

**ACTION:** Approve FY 2018 General and Dedicated Fund Blueprints, including setting Trustee and Benefit fund distribution to districts in FY 2018 at: \$425,000 in Base funding, \$678,200 in Match Formula funding, \$100,000 in Operating funding, and \$50,000 for Capacity Building funding.

**Attachment:** HB 296: FY 2018 ISWCC Appropriations Bill  
FY 2018 Budget Draft Blueprint (General and Dedicated Funds)

Return to Agenda

LEGISLATURE OF THE STATE OF IDAHO  
Sixty-fourth Legislature First Regular Session - 2017

IN THE HOUSE OF REPRESENTATIVES

HOUSE BILL NO. 296

BY APPROPRIATIONS COMMITTEE

AN ACT

1 APPROPRIATING MONEYS TO THE SOIL AND WATER CONSERVATION COMMISSION FOR FIS-  
2 CAL YEAR 2018; LIMITING THE NUMBER OF AUTHORIZED FULL-TIME EQUIVALENT  
3 POSITIONS; AND PROVIDING LEGISLATIVE INTENT REGARDING DISTRIBUTIONS TO  
4 THE CONSERVATION DISTRICTS.  
5

6 Be It Enacted by the Legislature of the State of Idaho:

7 SECTION 1. There is hereby appropriated to the Soil and Water Conser-  
8 vation Commission, the following amounts to be expended for the designated  
9 expense classes, from the listed funds for the period July 1, 2017, through  
10 June 30, 2018:

	FOR PERSONNEL COSTS	FOR OPERATING EXPENDITURES	FOR CAPITAL OUTLAY	FOR TRUSTEE AND BENEFIT PAYMENTS	TOTAL
11 FROM:					
12 General					
13 Fund	\$1,207,200	\$183,900	\$90,600	\$1,253,200	\$2,734,900
14 Administration and Accounting Services					
15 Fund		30,000			30,000
16 Resource Conservation and Rangeland Development					
17 Fund	167,100	146,400			313,500
18 Clean Water Revolving Loan (SCC)					
19 Fund		30,000			30,000
20 Federal Grant					
21 Fund	<u>17,500</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>17,500</u>
22 TOTAL	\$1,391,800	\$390,300	\$90,600	\$1,253,200	\$3,125,900

27 SECTION 2. FTP AUTHORIZATION. In accordance with Section 67-3519,  
28 Idaho Code, the Soil and Water Conservation Commission is authorized no more  
29 than seventeen and seventy-five hundredths (17.75) full-time equivalent  
30 positions at any point during the period July 1, 2017, through June 30, 2018,  
31 unless specifically authorized by the Governor. The Joint Finance-Appro-  
32 priations Committee will be notified promptly of any increased positions so  
33 authorized.

34 SECTION 3. LEGISLATIVE INTENT. It is the intent of the Legislature that  
35 \$100,000 of the amount appropriated in Section 1 of this act for trustee and  
36 benefit payments is to be distributed equally between the fifty (50) soil

1 and water conservation districts in addition to the amounts authorized under  
2 Section 22-2727, Idaho Code.

**FY 2018 IDAHO SOIL & WATER CONSERVATION COMMISSION**

**DRAFT General Fund Budget Blueprint**

<b>HB 296</b>	<b>Personnel</b>	<b>Operating</b>		<b>Capital</b>	<b>Trustee &amp; Benefit Funds (base, formula, &amp; capacity building)</b>	<b>TOTAL APPROPRIATION</b>
<b>General Fund</b>	\$1,207,200	\$183,900		\$90,600	\$1,253,200	\$ 2,734,900

<b>SWC Budget</b>	<b>Personnel</b>	<b>Operating</b>	<b>Contingency</b>	<b>Capital</b>	<b>District Allocations</b>				<b>TOTAL</b>
					<b>Base Funding</b>	<b>Match Funding</b>	<b>Operating Funding</b>	<b>Capacity Building</b>	
	\$1,207,200	\$182,061	\$1,839	\$90,600	\$425,000	\$678,200	\$100,000	\$50,000	\$2,734,900

**Operating Highlights**

*Assumes rent in the Water Center until October at \$3,605 per month (shared between general fund and RCRDP) and the remainder of the year at the increased rate per month of \$3,656 (shared between general fund and RCRDP).*

*Assumes SWCAP expenses including SCO, AG, STO estimated at \$44,200*

*Assumes appropriate amount of SWCAP, administrative (including postage, phone, rent expense, etc. ), and IT services charged to GF, RCRDP, & SRF*

*Ongoing expenses for MOU with Admin for IT, assumed to match FY 2017 actuals*

*Assumes general fund pays all of NRCS desk space and federal IT support*

*Small 1% operating contingency budgeted. Can be increased with personnel or operating cost savings or from dedicated funds (excluding RCRDP fund)*

**Personnel Highlights**

*Assumes fully staffed in general fund at 15.65 FTPs (2.1 FTPs in dedicated fund), all projected personnel costs fall within budget with approx. \$14k contingency*

*Assumes some related administrative time in RCRDP fund*

**Trustee/Benefits Highlights (District Allocations, Capacity Building)**

*Match formula for FY 2018 is an estimated state match of 1.14:1 based on FY 2016 local match funding (inc. \$50k cap). Doesn't include Operating or Capacity Building Funding*

**DRAFT FY 2018 IDAHO SOIL & WATER CONSERVATION COMMISSION**

**Dedicated Funds Budget Blueprint**

<b>REVENUE</b>	<b>Approx. Cash on hand 7/1/2017</b>	<b>Est. FY 2018 Income</b>	<b>TOTAL Dedicated Funds</b>
RCRDP	\$6,960,171	\$150,800	\$7,110,971
Federal Grant Fund	\$17,200		\$17,200
TA Cost Recovery	\$9,674	\$20,000	\$29,674
SRF Loan	\$48,297	\$11,858	\$60,155

<b><u>SPENDING AUTHORITY/ BUDGET</u></b>	<b>Personnel</b>	<b>Operating</b>	<b>Operating Contingency</b>	<b>Capital</b>	<b>TOTAL Spending Authority/Budgeted</b>
RCRDP	\$167,100	\$146,400			\$313,500
Federal Grant Fund	\$17,200				\$17,200
TA Cost Recovery		\$30,000			\$30,000
SRF Loan	-	\$8,465	\$21,535		\$30,000
Total	\$167,100	\$184,865	\$21,535	\$0	\$390,700

**Revenue Highlights**

*Approx. cash on hand 7/1/2017 is based on actual cash on hand on 4/4/2017. Does not include estimate of interest generated in RCRDP and SRF during remainder of FY 2017*

*Est. FY 2017 Income includes earned interest on current portfolio (excludes RCRDP late interest, new loan activity, and early payoffs) and billing to OSC for TA Cost Recovery)*

**Operating Highlights**

*Assumes interest income generated to RCRDP fund increases in FY 2018, but income generated does not meet appropriated spending authority*

*Assumes SWCAP expenses including SCO, AG, STO estimated at \$44,200*

*Assumes appropriate amount of SWCAP, administrative (including postage, phone, rent expense, etc. ), and IT services charged to GF, RCRDP, & SRF*

*Ongoing expenses for MOU with Admin for IT support assumed to match FY 2017 actuals*

*Assumes maximum income and expenditures under TA cost recovery*

*Assumes amount roughly equivalent to 10% of loan officer salary and benefits charged to SRF to cover administrative costs. Remainder held in contingency to cover late borrower payments, if necessary.*

*Assumes costs associated with meetings where RCRDP program or business conducted will be charged to RCRDP*

*Assumes 2.10 FTP RCRDP and office staff in RCRDP*

*Assumes .25 FTP of the Technical Records Specialist2 position will be funded by the NRCS*



**IDAHO SOIL & WATER  
CONSERVATION COMMISSION**

ITEM #4f

**TO: CHAIRMAN WRIGHT AND COMMISSIONERS RADFORD, GIER, WRIGHT, SLICHTER, AND TREBESCH**  
**FROM: TERI MURRISON, CAROLYN FIRTH, SHANTEL CHAPPLE KNOWLTON**  
**DATE: MARCH 30, 2017**  
**RE: Deep Soil Sampling Project for Marsh Creek, Minidoka, Twin Falls Priority Area**

As you will remember from a presentation from Carolyn Firth and Ralph Fisher (who works for EPA) last June, the Commission subcontracted with DEQ in FY 2016 to manage an educational Deep Soil Sampling Project in three High Nitrate Priority Areas in the Magic Valley. Last fiscal year we received \$20,000 of \$40,000 from DEQ (the total to be paid over the term of the contract) to begin the testing, however due to a lack of responses from qualified bidders, the work has yet to begin, so spending authority of a portion of the original \$20,000 was encumbered and transferred to the current fiscal year.

After continued attempts to formally identify subcontractors (through the state bidding process) to conduct the sampling and laboratory analysis portion of the Deep Soil Sampling Project for Marsh Creek, Minidoka, and Twin Falls Priority Areas, we have at last identified a qualified sampler and laboratory willing to do the work. Attached are draft service agreements to be signed with Ecopoint for sampling and Western Labs for data analysis.

Because Board policy requires approval by the Board of contracts over \$10,000 and non-routine contracts, we are bringing this forward for your consideration and approval. Due to the late start date, it may be necessary to again request an encumbrance of partial spending authority of current funds to next fiscal year to satisfy our sub-agreement with DEQ.

Should any changes to the contracts be negotiated prior to your meeting, staff will present them at your meeting. Shantel Chapple Knowlton has been involved in drafting the contracts and will be available for questions, as well.

**ACTION:** Approve and authorize Administrator to sign service agreement contracts with Ecopoint and Western Labs for sampling and analysis of project data

**ATTACHMENTS:**

- Contract/Service Agreement with Ecopoint Deep Soil Sampling
- Contract/Service Agreement with Western Labs Deep Soil Sampling

## **Service Agreement Post-Harvest Deep Soil Sampling Project**

THIS SERVICE AGREEMENT (“Agreement”) is made and entered into as of the \_\_\_ day of March, 2017, by and between the Idaho Soil and Water Conservation Commission, an agency of the State of Idaho (“ISWCC”) and Ecopoint, Inc., an Idaho Corporation (the “Contractor”), for the services described in this Agreement. In consideration of the mutual promises contained herein, the parties agree as follows:

### 1. RECITALS

1.1 ISWCC has entered into an agreement with the Idaho Department of Environmental Quality (IDEQ) to conduct the Post-Harvest Deep Soil Sampling Project.

1.2 Pursuant to IDAPA 38.05.01.044.01, ISWCC, through the Division of Purchasing, requested quotes from contractors to conduct deep soil sampling in Marsh Creek, Minidoka, and Twin Falls Nitrate Priority Areas.

1.3 ISWCC received only one quote, which was substantially above ISWCC’s available budget for the sampling services.

1.4 Under IDAPA 38.05.01.084.02(b), the Administrator of the Department of Purchasing may authorize negotiations when a competitive solicitation has been unsuccessful due to inadequate competition.

1.5 On February 22, 2017, ISWCC received authority from the Administrator to negotiate with the Contractor for the sampling services. Contractor is willing to provide the requested sampling services under the terms and conditions set forth in this Agreement.

### 2. AGREEMENT

2.1 The following documents attached hereto are incorporated into this Agreement by reference: Exhibit A (Scope of Work–Deep Soil Sampling); Exhibit B (Cost and Billing Procedures); and Exhibit C (Quality Assurance Project Plan (“QAPP”)).

2.2 This Agreement, including the above incorporated documents, sets forth the entire agreement between the parties related to the subject matter of this Agreement and may not be modified without the written consent of both parties.

2.3 Notwithstanding Section 2.2, ISWCC and IDEQ may from time to time amend the QAPP included herein as Exhibit C. The parties agree that such amendments to the QAPP shall be incorporated into this agreement upon Contractor receiving notice of such amendments. Such amendment shall supersede any conflicting terms in Exhibit A.

### 3. TERM OF AGREEMENT

This Agreement shall expire on December 31, 2017, unless the parties agree to an extension in writing, or unless the Agreement is earlier terminated as provided herein

#### 4. SCOPE OF WORK

4.1 The Contractor shall perform the deep soil sampling services set forth in Exhibit A and Exhibit C in accordance with the procedures set forth therein. The Contractor is responsible for ensuring that all of its officers, employees, agents, and subcontractors follow the procedures set forth in Exhibit A and Exhibit C while performing services under this Agreement.

4.2 The Contractor represents and warrants that it has the necessary and requisite skill to perform the work required under this Agreement and that its officers, employees, agents or subcontractors assigned by the Contractor to perform any such work will be qualified to perform the assigned duties.

4.3 The Contractor represents and warrants that it has completed, obtained and performed all registrations, filings, approvals, authorizations, certifications or examinations required by any government or governmental authority for all acts contemplated by this Agreement and has complied or will comply, with all existing, new or amended laws that apply to its performance under the Agreement.

#### 5. PAYMENT

5.1 ISWCC shall pay the costs and the Contractor shall bill ISWCC as set forth in Exhibit B.

5.2 ISWCC shall not be liable to the Contractor for any costs or expenses paid or incurred by the Contractor unless specifically set forth in this Agreement.

#### 6. OWNERSHIP

All information furnished to the Contractor for its use pursuant to this Agreement shall belong to ISWCC and shall be returned to ISWCC in good order upon completion of the Agreement or upon ISWCC's request. All documents, reports, and any other data developed by the Contractor for ISWCC in the performance of this Agreement shall become the property of ISWCC. ISWCC shall retain exclusive rights of ownership to all work produced by the Contractor under this Agreement.

#### 7. CONTRACT RELATIONSHIP

The Contractor's status under this Agreement shall be that of an independent contractor, and not that of an agent or employee. The Contractor is solely liable for all labor, taxes, insurance, required bonding and other expenses, except as specifically stated herein. The Contractor shall exonerate, indemnify and hold the State harmless from and against and assume full responsibility for payment of all federal, state and local taxes or contributions imposed or required under unemployment insurance, social security, workman's compensation and income tax laws with respect to the Contractor or Contractor's employees engaged in performance under this Agreement.

## 8. COMPLIANCE WITH THE LAW

The Contractor shall comply will all requirements of federal and state statutes, rules, and regulations applicable to Contractor or to the Services performed by Contractor pursuant to this Agreement.

## 9. CONFIDENTIALITY

Pursuant to this Agreement, Contractor may collect, or the ISWCC may disclose to Contractor, financial, personnel or other information that the ISWCC regards as proprietary or confidential (“Confidential Information”). Confidential Information shall belong solely to the ISWCC. Contractor shall use such Confidential Information only in the performance of its services under this Agreement and shall not disclose Confidential Information to any third party, except with the ISWCC’s prior written consent or under a valid order of a court or governmental agency of competent jurisdiction and then, only upon timely notice to the ISWCC. Contractor shall strictly comply with the recording requirements set forth in Section 3.6 of Exhibit A. The ISWCC may require that Contractor’s officers, employees, agents or subcontractors agree in writing to the obligations contained in this section. The ISWCC may require that Confidential Information be returned to the ISWCC upon termination of this Agreement. The confidentiality obligations contained in this section shall survive termination of this Agreement.

## 10. INDEMNIFICATION

The Contractor shall indemnify, defend and save harmless the State, its officers, agents and employees from and against any and all liability, claims, damages, losses, expenses, actions, attorney fees and suits whatsoever caused by or arising out of Contractor’s negligent or wrongful performance, act or omissions under this Agreement or Contractor’s failure to comply with any state or federal statute, law, regulation or rule. Nothing contained herein shall be deemed to constitute a waiver of the State’s sovereign immunity, which immunity is hereby expressly reserved.

## 11. INSURANCE

11.1 The Contractor shall obtain and maintain insurance at its own expense as required herein for the duration of this Agreement, and comply with all limits, terms and conditions stipulated. Policies shall provide, or be endorsed to provide, all required coverage. The Contractor shall provide certificates of insurance or certified endorsements as applicable for the insurance required. The Contractor shall not provide sampling services under this Agreement until satisfactory evidence of all required insurance is provided to ISWCC.

11.2 All insurance, except for Workers Compensation, shall be endorsed to name the State of Idaho and the Idaho Soil and Water Conservation Commission as Additional Insureds. The Contractor shall provide to ISWCC a certified endorsement naming the State of Idaho and the Idaho Soil and Water Conservation Commission as Additional Insureds.

11.3 All insurance shall be with insurers rated A-, VII, or better in the latest Bests Rating Guide, and be in good standing and authorized to transact business in Idaho. The coverage provided by such policies shall be primary. Policies may contain deductibles, but such deductibles shall not be deducted from any damages due the State or the ISWCC.

11.4 If any of the liability insurance required for this agreement is arranged on a “claims-made” basis, “tail coverage” will be required at the completion or termination of this agreement for a duration of twenty-four (24) months thereafter. Continuous “claims-made” coverage will be acceptable in lieu of “tail-coverage” provided the retroactive date is on or before the effective date of this agreement, or twenty-four-months “prior acts” coverage is provided. The Contractor will be responsible for furnishing certification of “tail coverage” or continuous “claims-made” coverage.

11.5 By requiring insurance herein, ISWCC does not represent that coverage and limits will necessarily be adequate to protect the Contractor, and such coverage and limits shall not be deemed as a limitation on the Contractor’s liability under the indemnities granted to the state.

11.6 Contractor shall maintain insurance in amounts not less than the following:

11.6.1 Commercial General Liability (CGL) with a limit of not less than \$1,000,000 each occurrence, and \$1,000,000 annual aggregate, if defense is outside the limits. If defense is inside the limits, the limit must be \$2,000,000 each occurrence, and \$2,000,000 aggregate. If necessary, a commercial umbrella or excess policy may be used to meet the limits required, providing the CGL is listed on the underlying insurance in the umbrella or excess policy, and the umbrella/excess policy meets the requirements above for acceptable carriers.

11.6.2 Automobile Liability including owned, non-owned, and hired liability with a limit of not less than \$1,000,000 each occurrence, and \$1,000,000 aggregate. If necessary, a commercial umbrella or excess policy may be used to meet the limits required, providing the Auto is listed on the underlying insurance in the umbrella or excess policy, and the umbrella/excess policy meets the requirements above for acceptable carriers.

11.6.3 Workers Compensation Insurance in amounts as required by statute in all states in which the contractor performs work, and Employers’ Liability with a limit of \$100,000 Bodily Injury by Accident-each Accident, \$100,000 Bodily Injury by disease-each employee, \$500,000 Bodily Injury by Disease-policy limit.

## 12. ASSIGNMENTS, SUBCONTRACTS, MERGER AND CONSOLIDATION

12.1 The Contractor shall not assign all or a portion of this Agreement without ISWCC’s prior written permission. The Contractor shall not enter into any subcontract relating to the performance of this Agreement or any part thereof without ISWCC’s prior written permission. Approval by ISWCC of the Contractor’s request to subcontract or acceptance of or payment for subcontracted work by ISWCC shall not in any way relieve

the Contractor of any responsibility under this Agreement. The Contractor shall be and remain liable for all damages to ISWCC based on negligent performance or non-performance of work under the Agreement by Contractor's subcontractor or its sub-subcontractor.

12.2 Any entity into which Contractor may be merged or with which it may be consolidated, any entity resulting from any merger or consolidation to which Contractor is a party, or any entity succeeding to the business of Contractor shall not become the successor of Contractor without first obtaining the prior written approval of the ISWCC.

### 13. TERMINATION

13.1 Either party may terminate this Agreement immediately upon written notice if at any time: (a) the other party is in material breach of a warranty, term, condition, covenant or obligation under this Agreement and fails to cure that breach within ten (10) days written notice thereof; or (b) Contractor is in breach of Section 9 on Confidentially and/or Section 3.6 of Exhibit A.

13.2 ISWCC may terminate this Agreement for its convenience in whole or in part, upon thirty (30) days written notice to Contractor, if ISWCC determines it is in its best interest.

13.3 Upon termination of this Agreement, Contractor shall (a) promptly discontinue all work, unless the termination notice directs otherwise; and, (b) promptly deliver or make available to ISWCC all data, reports, forms, field documentation and other information and materials gathered by Contractor in performing services under this Agreement.

### 14. NOTICES

Any notice given in connection with the Agreement shall be given in writing and shall be delivered either by hand to the other party or by certified mail, return receipt requested, to the other party at the other party's address stated below. Either party may change its address by giving notice of the change in accordance with this paragraph.

Contractor:      Ecopoint, Inc.  
                         223 Center St. E.  
                         Kimberly, ID 83341  
                         Attention: Michael Clancy

ISWCC:            Idaho Soil and Water Conservation Commission  
                         1361 E. 16th St.  
                         Burley, ID 83318  
                         Attention: Carolyn Firth

### 15. FISCAL NECESSITY AND NON-APPROPRIATION

It is understood and agreed that ISWCC is a governmental entity, and the Agreement shall in no way or manner be construed so as to bind or obligate ISWCC or the State of Idaho beyond the term of any particular appropriation of funds by the State Legislature or United States Congress as may exist from time to time. ISWCC reserves the right to reduce the Agreement automatically or terminate the Agreement if, in its sole judgment, the legislature of the State of Idaho or the United States Congress fails, neglects, or refuses to appropriate sufficient funds as may be required for ISWCC to continue payments or if the Executive Branch mandates any cuts or holdbacks in spending. Any such reduction or termination shall take effect on thirty (30) days prior notice.

16. PUBLIC RECORDS

Pursuant to Idaho Code section 74-101 *et seq.*, information or documents received from the Contractor may be open to public inspection and copying unless exempt from disclosure. The Contractor shall clearly designate individual documents as “exempt” on each page of such documents and shall indicate the basis for such exemption. ISWCC will not accept the marking of an entire document as exempt. In addition, ISWCC will not accept a legend or statement on one (1) page that all, or substantially all, of the document is exempt from disclosure. Contractor shall indemnify and defend the ISWCC against all liability, claims, damages, losses, expenses, actions, attorney fees and suits whatsoever for honoring such a designation or for the Contractor’s failure to designate individual documents as exempt. The Contractor’s failure to designate as exempt any document or portion of a document that is released by the State shall constitute a complete waiver of any and all claims for damages caused by any such release. If the State receives a request for materials claimed exempt by the Contractor, the Contractor shall provide the legal defense for such claim.

17. GOVERNING LAW

This Agreement shall be governed by the laws of the State of Idaho. The venue of any action brought by any party to this Agreement shall be the Fourth District Court in and for the County of Ada.

18. SOVEREIGN IMMUNITY

Nothing contained herein shall be deemed to constitute a waiver of the State’s sovereign immunity, which immunity is hereby expressly reserved.

19. FORCE MAJEURE

Neither party shall be liable for or deemed to be in default for any delay or failure to perform under this Agreement if such delay or failure to perform results from an act of God, civil or military authority, act of war, riot, insurrection or other occurrence beyond that party’s control. In such case, the intervening cause must not be caused by the party asserting it and the excused party is obligated to promptly perform in accordance with the terms of this Agreement after the intervening cause ceases.

20. TAXES

The State of Idaho and ISWCC are generally exempt from payment of Idaho State Sales and Use Tax for property purchased for its use under the authority of Idaho Code, Section

63-3622 as a government instrumentality. In addition, the State of Idaho and ISWCC are generally exempt from payment of Federal Excise Tax under a permanent authority from the district Director of the Internal Revenue Service. Exemption certificates will be furnished upon written request by the Contractor. If the Contractor is required to pay any taxes incurred as a result of doing business with the State of Idaho, it shall be solely responsible for the payment of those taxes.

21. NO WAIVER

The waiver of any breach or default of this Agreement shall not be construed as or deemed to be a waiver of any subsequent breach or default.

22. SEVERALBILITY

If any part of this contract is declared invalid or becomes inoperative for any reason, such invalidity or failure shall not affect the validity and enforceability of any other provision.

23. SURVIVAL.

Any termination, cancellation, or expiration of this Agreement notwithstanding, provisions which are intended to survive and continue shall survive and continue, including, but not limited to, the provisions of sections 2, 6, 7, 9–11, and 15–22.

24. HEADINGS

The captions and headings contained herein are for convenience and reference and are not intended to define or limit the scope of any provision of this Agreement.

Unless otherwise stated above, this Agreement is effective on the date of last signature:

Contractor's Legal Name	
Contractor's Authorized Representative's Printed Name	Title
Signature	Date

ISWCC's Administrator Printed Name	
Signature	Date

**Exhibit A**  
**Scope of Work–Deep Soil Sampling**

The following is a detailed overview of the requirements and procedures for sampling services for the Post-Harvest Deep Soil Sampling Project (PHDSSP). A more thorough description of these requirements and procedures including the definitions of terms and the forms (Appendixes) referred to herein are in Exhibit C (Quality Assurance Project Plan (“QAPP”)).

1. General Requirements:

1.1. The Contractor shall:

- 1.1.1. Collect soil samples from fields identified by the Idaho Soil & Water Conservation Commission (ISWCC) representative and the respective grower.
- 1.1.2. Take samples after crop harvest, but prior to nitrogen applications where possible.
- 1.1.3. Begin sampling in the spring of 2017.
- 1.1.4. Collect samples at one (1)-foot increments, beginning at zero to twelve (0 to 12) inches to a depth not exceeding six (6) feet, or to the depth of refusal, such as basalt, gravel, or caliche.
- 1.1.5. Record soil descriptions in the field and identify and document the Natural Resources Conservation Service (NRCS) Soil Series.
- 1.1.6. Transmit soil samples collected in the field directly to the laboratory or to a designated representative of the laboratory contracted by the ISWCC to analyze the samples.
- 1.1.7. Complete a Chain of Custody (COC) form (QAPP, App. A) for each batch of consolidated soil samples submitted to the laboratory for analysis.
- 1.1.8. Ensure all soil sampling work is done by individuals qualified to perform the work.

2. Sampling Method Requirements:

- 2.1. Contractor shall contact producers/growers agreeing to participate and schedule a time for sampling.
- 2.2. ISWCC shall provide the producer with the Deep Soil Sampling Program Questionnaire (QAPP, App. A) and the Grower Producer Release form (QAPP, App. A) and the Contractor will assign the grower a Unique Identification Number following the pattern set forth in section 10.2 of the QAPP (Ex. C). Contractor shall submit the signed release form to ISWCC. The Unique Identification Number shall not be included on the release form.
- 2.3. Once the designated fields for sampling are identified, the Contractor shall select a sampling zone, which is representative of the field or management unit being sampled, in conjunction with the grower and the ISWCC representative.
  - 2.3.1. A minimum of one hundred (100) feet shall be established as a setback from field edges, field entry points, field borders, the first span of a center pivot, harvest haul roads, and water features such as ditches, ponds, waterways, or drainage ditches.

- 2.3.2. In order to avoid power and other utility lines, the Contractor must contact the utility notification center (<http://www.callbeforeyoudig.org>) and leave sufficient time for their response prior to doing field work.
- 2.4. The Contractor must communicate with the grower to identify and record the location of utilities on private land and ensure any underground utilities located within two hundred (200) feet of the agreed-upon sample sites are flagged or staked. Grower will be asked to sign a release form (QAPP, App. A) stating that the grower is responsible for providing Contractor with an accurate location of underground private utilities on the property and will not hold ISWCC and Contractor liable for any damages, losses, or expenses arising from grower's failure to correctly identify the location of any underground private utilities, including but not limited to irrigation mainline, electrical lines, or any other structures.
- 2.5. The Contractor must select five (5) sampling sites within each sampling zone. The sites shall be located within the predominant soil type(s) of the field deemed to be representative of the management program and physical attributes of the field including soil texture, irrigation type, slope, water table, and other relevant physical features.
- 2.6. The Contractor shall drill one (1) borehole at each sampling site and take six (6) discrete samples (i.e. one sample per foot) to a depth of six (6) feet, or until refusal, whichever is shallower.
  - 2.6.1. If depth of refusal is met, a minimum of four (4) boreholes are required within each sampling zone.
  - 2.6.2. A mechanized (e.g. pneumatic, hydraulic) sampling tool (e.g. Giddings, AMS, GeoProbe) that can collect soil from discrete one (1)-foot increments that does not allow cross contamination of samples must be utilized.
- 2.7. The Contractor shall place the discrete one (1)-foot samples from each borehole into clean plastic buckets (one (1) for each depth interval), then mix to consolidate the soil into one representative, composite one (1)-foot sample to be analyzed.
- 2.8. After compositing, the Contractor must transfer a portion of soil in each quadrant of the bucket to a lab-prepared sample bag.
- 2.9. The Contractor must clean the buckets at least between each sampling site.
- 2.10. The Contractor must clean the parts of the sampling tools that contact the soil between each sampling run to minimize cross-contamination of samples.
  - 2.10.1. A stiff wire brush may be used to remove any adhering soil from the probe.
- 2.11. The Contractor shall ensure the minimum nominal diameter of the standard cores between one and three quarters ( $1\frac{3}{4}$ ) and is two (2) inches; however, below a depth where a sampler is unable to advance a two (2)-inch core, as small as a one (1)-inch diameter core may be used.
- 2.12. If refusal occurs prior to six (6) feet, the Contractor shall record the sampling depths that were reached and samples collected for that site on the Soil Sampling Field Form (QAPP, App. A).
- 2.13. The Contractor shall clearly mark the sample bag to identify the producer-assigned Unique Identification Number, the field number, the date and time of collection, the sampler's initials, and the soil depth represented by that sample.

2.14. The Contractor must backfill boreholes using tamped native soil to prevent creation of a vertical conduit.

3. Reporting Requirements:

3.1. The Contractor must complete one (1) Soil Boring Log and Sample Field Form (QAPP, App. A) for each field/zone sampled in order to document the soil sample compositing and lab-submittal process.

3.1.1. The Contractor shall describe each discrete soil sample in terms of consistency, moisture content, color, grain size (texture), and other observations such as odor.

3.2. The Contractor must submit the completed forms (Soil Boring Log and Sample Field Form and Grower/Producer Release Form) to the ISWCC within three weeks from the date the samples were delivered to the designated laboratory for analysis.

3.3. The grower will fill out the Grower Questionnaire (QAPP, App. A) for each field/zone sampled and will return the form(s) to the ISWCC.

3.4. Original copies of the Agricultural Soil Submission Form (QAPP, App. A) and the Chain of Custody Form (QAPP, App. A) will be maintained by the analyzing laboratory and made available as per standard practices.

3.5. All other forms and any other documentation of field work including copies of soil survey maps and interpretive descriptions, notes or related information collected by the sampler during the sampling process shall be submitted to ISWCC.

3.6. The following information shall not be included in any form, report, or documentation, created, collected, or acquired while performing services under this Agreement: information that may tend to reveal the owner of the field being sampled; information that may associate the location and/or owner of the field being sampled with the Unique Identification Number (UIN) for the sample. Contractor shall be responsible for ensuring that all employees, officers, agents and subcontractors performing services under this agreement comply with this recording requirement.

3.7. Completed forms and required documentation shall be submitted to

Carolyn Firth

Idaho Soil and Water Conservation Commission

1361 E. 16th St.

Burley, ID 83318

Email: Carolyn.Firth@swc.idaho.gov

4. Custody and Handling Requirements:

4.1. The Contractor shall follow the sampling and handling procedures as described in the University of Idaho Bulletin 704 (QAPP, App. D).

4.2. The Contractor shall deliver soil samples directly to the laboratory or to a designated drop off location of the laboratory contracted by the ISWCC to analyze the samples.

4.3. The Contractor shall complete a Chain of Custody (COC) form (QAPP, App. A) for each batch of samples delivered.

4.3.1. The COC must include the date, time, sampler name, the Unique Identification Number (UIN) and sample depth for each sample submitted.

- 4.3.2. The Contractor relinquishing the samples and the laboratory receiving the samples must both sign the COC.
  - 4.3.3. The “owner” and “client” information on the COC is the ISWCC, not the grower.
  - 4.4. The Contractor shall complete an Agricultural Soil Submission form (QAPP, App. A) for samples from each site to be given to the laboratory
    - 4.4.1. The soil submission form will include contact and billing information for ISWCC (not the grower/producer) and pertinent sample-specific information – sample identification number and the UIN.
  - 4.5. For delivery to the lab, the Contractor must place the samples in a cooler with reusable ice substitutes or with ice. If ice is used, sample containers must be placed inside a waterproof bag to prevent contact with melting ice.
  - 4.6. At no time shall the Contractor store samples for more than forty-eight (48) hours.
  - 4.7. The Contractor may dry samples using methods acceptable to the laboratory and consistent with analytical methods.
5. Quality Assurance Requirements:
- 5.1. Take duplicate samples, which shall consist of split samples and shall comprise ten percent (10%) of the total samples collected for analysis.
    - 5.1.1. Duplicate samples shall be labeled according to the pattern set forth in section 10.2 of the QAPP (Ex. C).
    - 5.1.2. All relevant information shall be recorded for the duplicates, just like the normal samples.
    - 5.1.3. Duplicate samples shall be submitted blind for analysis following the procedures set forth in section 14.1 and Appendix D of the QAPP (Ex. C).
  - 5.2. Submit performance evaluation (PE) samples (blind samples, which are soil samples with known nitrate concentration) to the laboratory upon ISWCC’s request.
    - 5.2.1. The ISWCC representative will provide the samples to the Contractor.
    - 5.2.2. ISWCC may discuss the results of the analysis of the quality assurance samples with Contractor and contracted laboratory to determine the cause of problems and arrange for changes in procedures to achieve the data quality objectives.
  - 5.3. Assure the soil sampling tools are clean and in proper operating condition.
  - 5.4. Only accept clean, new, and unused sample bags from the laboratory.

**Exhibit B**  
**Cost and Billing Procedure**

1. ISWCC agrees to pay the Contractor a flat fee of \$395.00 for each field the Contractor samples in accordance with the requirements and procedures set forth in Exhibit A and Exhibit C, for up to a maximum of 70 fields.
2. Certain funding for the Post Harvest Deep Soil Sampling Project (PHDSSP) expires on June 30, 2017. In order for funding to be maximized, services in the amount of \$15,000 from Contractor and the contracting lab combined must be completed and invoiced by June 15, 2017. If \$15,000 worth of services are not completed and invoiced by June 15, 2017, the maximum number of fields for which ISWCC agrees to pay the Contractor to sample shall be reduced to account for the loss of funds.
3. The Contractor shall provide a signed invoice to ISWCC biweekly for services performed. ISWCC shall pay Contractor within 30 days of receipt of an accepted invoice, provided that ISWCC does not dispute any of the charges therein.
4. No invoice will be accepted or paid without receipt of documentation. Invoices submitted without the required documentation will be returned to the Contractor for resubmission.
5. The Contractor must provide the following information with each invoice:
  - i. Contract Number: PHDSSP-01
  - ii. Name of project: Post Harvest Deep Soil Sampling Project
  - iii. Identification of billing period.
  - iv. Total amount billed for the billing period.
  - v. Detailed description of services, including number of fields sampled.
  - vi. Name of authorized individual and contact information for Contractor.
6. Invoices are to be submitted to:

Idaho Soil and Water Conservation Commission  
322 E. Front St., Suite 560  
Boise, ID 83702  
Attn: Rhonda Yadon, Financial Manager

**EXHIBIT C**

**QUALITY ASSURANCE PLAN: DEEP SOIL  
SAMPLING PROJECT: MARCH CREEK, MINIDOKA  
AND TWIN FALLS NITRATE PRIORITY AREAS**

# Quality Assurance Project Plan

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Deep Soil Sampling Project: Marsh Creek, Minidoka and  
Twin Falls Nitrate Priority Areas



**State of Idaho  
Department of Environmental Quality**

**Ground Water Program**

**Version 1.0**

**March 23, 2017**

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## 1 Title and Approval Page

### Quality Assurance Project Plan

Title: Deep Soil Sampling Project: Marsh Creek, Minidoka and Twin Falls Nitrate Priority Areas

Region/Division: Ground Water Program

Version Number: 1.0

Date: March 23, 2017

### Approval Signatures

Note: This QAPP becomes effective on the date of the last approval signature.

#### Program/Regional Manager - Department of Environmental Quality

Signature:  3/23/2017  
Name: Ed Hagan, Program Manager Date

#### Project Quality Assurance Officer - Department of Environmental Quality

Signature:  3/24/2017  
Name: Flint Hall, Environmental Scientist Date  
\*Note: At the time of QAPP signature, the project QAO is required to update the DEQ QAO project document tracker, found at TRIM Record #2012AEB8.

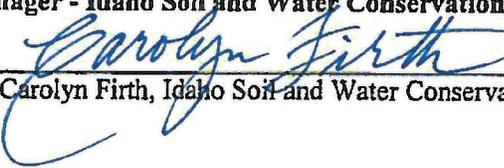
#### Project Manager - Department of Environmental Quality

Signature:  3/23/17  
Name: Amy Williams, Source Water Program Manager Date

#### Administrator - Idaho Soil and Water Conservation Commission

Signature:  3/24/17  
Name: Teri Murrison, Administrator Date

#### Project Manager - Idaho Soil and Water Conservation Commission

Signature:  3/24/17  
Name: Carolyn Firth, Idaho Soil and Water Conservation Commission Date

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- Appendix A. Field Data Collection Forms
- Appendix B. Nitrate Priority Area Maps and County FIPS Codes
- Appendix C. Project Checklists
- Appendix D. Procedures

### 3 Distribution List

At a minimum, the following personnel and analytical laboratory contacts will receive either an electronic or hard copy of the final signed quality assurance project plan (QAPP) (Table 1).

**Table 1. Project QAPP distribution list.**

<b>Name</b>	<b>Project Affiliation</b>	<b>Organization and Address/Location</b>	<b>Contact Number, e-mail</b>
Don W Zaroban, PhD	DEQ Quality Manager	DEQ—Director's Office	(208) 373-0405 Don.Zaroban@deq.idaho.gov
Ed Hagan, PG	Program/Regional Manager	DEQ—State Office Ground Water Program Manager	(208) 373-0356 Ed.Hagan@deq.idaho.gov
Flint Hall, PG	Project Quality Assurance Officer	DEQ—Idaho Falls Regional Office	(208) 528-2650 Flint.Hall@deq.idaho.gov
Amy Williams, DEQ, Carolyn Firth, ISWCC	Project Manager, DEQ  Project Manager, ISWCC	DEQ—State Office, Source Water Protection Program ISWCC,	(208) 373-0115 Amy.Williams@deq.idaho.gov (208) 678-1225 X110, Carolyn.Firth@swc.idaho.gov
Teri Murrison	Administrator, ISWCC	322 E Front Street, Suite 560 Boise, ID 83702	(208) 332-1790 Teri.Murrison@swc.idaho.gov
Ralph Fisher, EPA	Nutrient Management Specialist, EPA, Technical support	EPA 950 W. Bannock St. Suite 900 Boise, Idaho 83702	(208) 378-5761 fisher.ralph@epa.gov
April Leytem, NRCS	Research Soil Scientist, Technical Support	USDA Agricultural Research Service 3793 N 3600 E Kimberly, ID 83341	(208) 423-6530 april.leytem@ars.usda.gov
Michael Clancy	Sampling Contractor	Ecopoint, Inc. 223 Center Street, Kimberly, ID 83341	(208) 596-8194
Cathy Bingham, Western Laboratories, Inc	Analytical Laboratory	Western Laboratories, Inc 211 Hwy 95, Parma, ID 83660	(208) 649-4360

## 4 Project/Task Organization

Key project personnel and their responsibilities are defined in Table 2. An organizational chart is provided in Figure 1.

The project staff duties and responsibilities described in Table 2 are not intended to be all inclusive; see sections 1.2.5 through 1.2.7 of the DEQ *Quality Management Plan* (QMP) (DEQ 2012a) for a more detailed description.

**Table 2. Key project personnel and associated responsibilities.**

Name	Project Title/Responsibility
Ed Hagan, PG	<p><b>Program/Regional Manager:</b> Note: The following description is <i>not all inclusive</i>; see section 1.2.7 of the DEQ QMP for a more detailed description. This person is the regional manager or State Office program manager for the project. Duties and responsibilities include:</p> <ul style="list-style-type: none"> <li>• Assists in the review of the QAPP and signs the final QAPP as an approver.</li> <li>• Confirms the project QAPP meets the needs of the program/region.</li> <li>• Ensures the QAPP is approved prior to the start of project work.</li> <li>• Ensures the program/regional procedures and policies referenced in the QAPP are current and approved for use.</li> <li>• Performs all duties and responsibilities as assigned in the project QAPP.</li> <li>• Selects and assigns a project quality assurance officer (QAO), who meets the criteria for independence defined in the DEQ QMP (see QAO duties below), and obtains approval for this selection from the DEQ quality manager.</li> </ul>
Flint Hall, PG	<p><b>Project Quality Assurance Officer:</b> Note: The following description is <i>not all inclusive</i>; see section 1.2.5 of the DEQ QMP and the project QAPP for a more detailed description. Duties and responsibilities include:</p> <ul style="list-style-type: none"> <li>• Assists in the review of the QAPP, verifies the QAPP meets the requirements of the DEQ QMP, and signs the QAPP as an approver.</li> <li>• <i>All assigned QAOs are required to contact the DEQ quality manager to discuss the project prior to signing any project QAPP for approval. When the project QAO signs the QAPP for approval, the QAO is required to update the DEQ QAO project document tracker found at TRIM record #2012AEB8.</i></li> <li>• Performs an annual audit, using the QAO audit checklist located in Appendix B, on all assigned projects to evaluate project compliance with the approved project QAPP. Files the completed audit checklist in TRIM to document the audit.</li> <li>• Provides data validation per the project QAPP, using the appropriate checklist located in Appendix B, and may also participate in final project report review.</li> <li>• Documents all audit and data validation activities in the DEQ TRIM system, per the DEQ QMP and the approved QAPP.</li> <li>• In matters of project quality, this individual has a direct line of communication to the DEQ quality manager.</li> <li>• Must meet the following independence criteria: The QAO shall not be the project manager, program manager, or be otherwise assigned to the project data generation efforts. Neither the project manager nor the QAO may directly report to the other within the DEQ organizational structure, and both of these individuals may not be directly supervised by the same person.</li> <li>• Performs all other duties and responsibilities as assigned in the project QAPP. The duties and responsibilities of the project QAO also apply to any field sampling plan (FSP) generated under the project QAPP, unless an FSP-specific QAO is assigned and approved.</li> </ul>
Amy Williams, DEQ, Carolyn Firth, ISWCC	<p><b>Project Manager - DEQ:</b> Note: The following description is <i>not all inclusive</i>; see section 1.2.6 of the DEQ QMP and the project QAPP for a more detailed description. Duties and responsibilities include:</p> <ul style="list-style-type: none"> <li>• General role is to complete responsibilities related to adherence to DEQ QMP and contracting requirements.</li> <li>• Oversees subgrant agreement with Idaho Soil and Water Conservation Commission, ensuring adherence to contract requirements. Completes required subgrant regular reporting requirements.</li> </ul>

Name	Project Title/Responsibility
	<ul style="list-style-type: none"> <li>• Signs the final QAPP as an approver. Enters the approved and current project QAPP in the TRIM system, including a copy of the signed approval page.</li> <li>• Ensures all project work is conducted in accordance with the DEQ QMP, the approved QAPP, and the applicable project operating procedures.</li> <li>• Performs data review and verification per the project QAPP, using the appropriate checklists located in Appendix A</li> <li>• Reviews the project QAPP/FSP and standard operating procedures (SOPs) annually to determine if revision is necessary. If the project QAPP, FSP, or associated SOPs do require revision, the project manager initiates such action. All such documents will be revised, reviewed, and approved in accordance with the DEQ QMP.</li> <li>• Documents all audit and data review/verification activities in the DEQ TRIM system, per the DEQ QMP and approved QAPP.</li> <li>• Ensures all appropriate project and tracking documentation are maintained in TRIM.</li> </ul> <p><b>Project Manager - ISWCC:</b> Note: The following description is not all inclusive. Duties and responsibilities include:</p> <ul style="list-style-type: none"> <li>• General role is to complete responsibilities related to adherence to DEQ subcontract agreement and completion of field work in accordance to the approved QAPP/FSP.</li> <li>• Performs overall project planning, document development and approval, sample planning and coordination, laboratory coordination, reporting functions, and project report/summary development.</li> <li>• Generate and implement a contract with a selected contractor to collect and analyze soil samples.</li> <li>• Ensures that ISWCC/subcontractor Personnel assigned to this project are appropriately trained and qualified,</li> <li>• Work with the contractor and the producers to identify specific fields and sampling sites for each participating producer.</li> <li>• Develop and implement a data base management procedure to store and protect data confidentiality for participating producers.</li> <li>• Generate published soil survey maps and interpretations for each selected field. Provide that information to the contractor.</li> <li>• Provide guidance and oversight to the contractor to insure implementation of all phases of the sampling, analysis, and data management procedure as required.</li> <li>• Review the laboratory analysis of soil samples with each producer when received from the contractor and as necessary determine additional nutrient and/or irrigation planning and implementation strategies.</li> <li>• With the assistance of the Soil and Water Conservation Districts and the Ground Water Quality Improvement Committees, develop and implement a public information program to ensure public and producer awareness and understanding of the project, as needed.</li> </ul>
<p>Michael Clancy,                      Ecopoint, Inc.</p>	<p><b>Project Staff/sampling subcontractor:</b> This is the primary contact the subcontractor for soil sample collection and for interface with the</p> <ul style="list-style-type: none"> <li>• Contacts and coordinates with producers to facilitate sample collection</li> <li>• Ships samples to the laboratory, Completes field sample forms and provides to ISWCC</li> </ul>
<p>Cathy Bingham,                      Western</p>	<p><b>Laboratory Contact/Manager:</b> This person is the primary contact at the laboratory for DEQ/ISWCC project staff</p> <ul style="list-style-type: none"> <li>• The laboratory contact/manager issues sample receipts, and verifies analysis,</li> </ul>

Name	Project Title/Responsibility
Laboratories, Inc	and confirms the laboratory data review. <ul style="list-style-type: none"> <li>• Provides web interface for Grower/Producers to access soils results</li> </ul>
April Leytem, NRCS	<b>Project Staff: Soil Sampling/Analysis Technical Support</b> <ul style="list-style-type: none"> <li>• Provides PE samples and technical support for laboratory analyses</li> </ul>

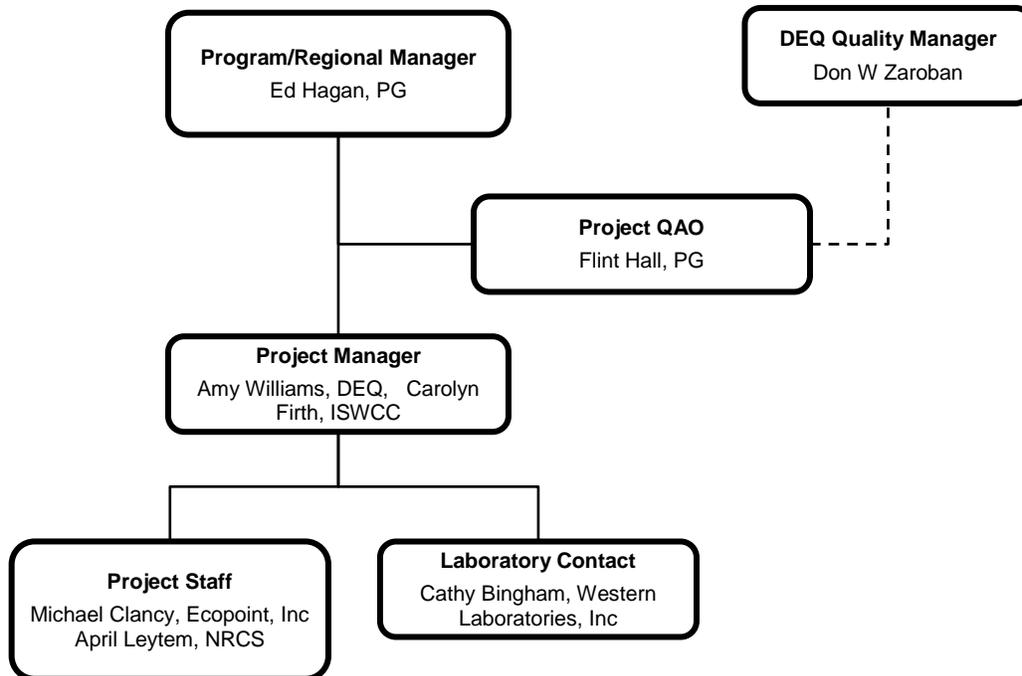


Figure 1. Project organizational chart.

## 5 Problem Definition/Background

Nitrate is one of the most widespread ground water contaminants in Idaho and the most common contaminant found in public water supply systems. High levels of nitrate in drinking water are associated with adverse health effects.

The Idaho Department of Environmental Quality (DEQ) has established a goal of restoring degraded ground water and protecting public drinking water sources. To facilitate achieving this goal, DEQ has developed a list of degraded ground water areas within the state of Idaho. This list focuses on nitrate and ranks the top 34 nitrate-degraded areas (referred as nitrate priority areas or NPAs) in the state based on the severity of the degradation; the rank of “1” indicates the most severely impacted area.

The Marsh Creek area, located in Cassia County, is the #1 ranked NPA on the most current list of degraded areas (2014). Minidoka NPA is ranked #25, and Twin Falls NPA is ranked #21.

## 5.1 Problem Statement

To affect improvement in ground water, DEQ partners with others, including the Idaho Soil and Water Conservation Commission (ISWCC) to evaluate effectiveness of efforts to reduce impacts to degraded ground water and to restore water quality.

The Idaho Soil and Water Conservation Commission (ISWCC) proposes to conduct post-harvest deep soil sampling (PHDSS) on fields located within the Marsh Creek, Minidoka, and Twin Falls NPAs to help interested land users see the relationship between management practices applied on a specific field and ground water quality impacts.

The ISWCC Post Harvest Deep Soil Sampling Project (PHDSS) will assist in demonstrating the relationship of applied nutrients and irrigation water in a field to ground water quality. This study does not directly monitor the application rates or efficiency of applied irrigation water; instead it focuses on the final results of applied nutrient and irrigation water of soil test nitrogen concentrations. Demonstration of the qualitative results of nutrient management practices will provide the basis for educating agricultural producers to the effectiveness of their nutrient and irrigation water management in maintaining nutrients within the crop rooting depth.

Application of nutrients in excess of crop needs in concert with over application of irrigation water results in excessive concentration of nitrogen below the root zone. Nitrogen found below the root zone at the end of the growing season is symptomatic of imperfect nutrient and irrigation water management techniques applied to the field through the growing season and from previous applications. Measuring deep soil nitrate may help identify activities that contribute to nitrate ground water contamination and provide relatively quick feedback on the effectiveness of changes to management practices designed to reduce ground water contamination.

Initial deep soil sampling will be conducted for the purposes of:

- Establishing baseline data: Provide field specific baseline data regarding the nitrogen content (nitrate, and ammonium) of soils underlying a variety of soil, crop, nutrient sources, and irrigation systems within the project area.
- Educating producers: Provide the foundation for a technically based education program. The intent of the project is to provide field specific information to producers that they will use to evaluate their current nutrient and irrigation water management practices and if necessary modify those practices leading to reduced soil test concentrations and ultimately, improved ground water quality.
- Serving as a pilot project: Provide information about project design, practical realities, time requirements and costs that can be used in developing subsequent project scopes.

## **5.2 Intended Usage of Data**

The intent of this project is to provide an improved understanding of the correlation between residual nutrients, current production methods, and areal extent of regions of nitrate degraded ground water. Information will be collected in a manner that will aid those that participate in improving their farming practices and well as ensures confidentiality as required by law. Sample results and recommendations will be reported back to the participants.

Information gained will be used to increase public awareness of the project through various means and will be used to guide education and communication efforts. Summary reports will be provided to DEQ.

## **6 Project/Task Description**

### **6.1 General Overview of Project**

Deep soil sampling will be conducted initially for one growing season to collect baseline information. Deep soil sampling may be repeated in future years, as funding allows, allowing analysis of the effects of changing management practices.

The deep soil sampling project will be implemented by the Idaho Soil and Water Commission and is summarized as follows:

1. Grower participation will be solicited by general mailings and outreach by the ISWCC, local conservation districts, the Cassia County/Minidoka County Ground Water Quality Improvement Committee and the Twin Falls County Ground Water Quality Management Advisory Committee members.
2. Producer confidentiality: The ISWCC will develop a process for data collection and analysis designed to separate the identity of participating producers and the specific locations of the sample sites from data and analysis generated. Part of this process is the use of a unique identification number (UIN) system. Soil samples and results from the analysis will be identified only by the UIN.
3. Completion of a Deep Soil Sampling Program Questionnaire by the grower that includes information specific to an individual field such as pertinent management information including cropping systems, nitrogen sources and amounts, historical yields, irrigation practices and application methods (Appendix A). Unless the producer includes identifying information on the questionnaire, the questionnaire will only be identified with the UIN.

4. Soil sampling and analysis will begin in pre-fertilization, spring, 2017. Soil samples will be:
  - Taken prior to fertilization prior to planting in the spring, and after crop harvest but prior to nitrogen applications where possible.
  - It's desirable to sample the same fields pre-fertilization and post-harvest, dependent on availability and permissions.
  - Collected at 1-foot increments from 0 feet to a depth not exceeding 6 feet, or to the depth of refusal, such as basalt, gravel or caliche that defines the limits of a shallower potential root zone.
  - The 0-1 foot soil sample will be analyzed for pH, salts, sodium, CEC, excess lime, organic matter, organic nitrogen, macronutrients (nitrate, phosphorus, potassium, calcium, magnesium, and sulfate) and micronutrients (zinc, iron, manganese, copper, and boron).
  - Soil samples taken below 1 foot will be analyzed for nitrate, ammonium, and phosphorus only.
  - Soil descriptions will be recorded in the field, and the NRCS Soil Series will be identified and documented.
5. Sampling and analysis will be performed by qualified firms which will be contracted to ISWCC.
6. ISWCC will analyze results from soil sampling to identify the risk of nitrate leaching posed by the various soil/cropping/irrigation systems.
7. Generalized technical data and results will be provided to DEQ as part of a summary report, but grower specific information will not be provided to DEQ. Locational and Grower/Producer information will be kept separated from soil sampling and questionnaire results by a Unique Identification Number (UIN) supplied to the grower.

## 6.2 Project Timetable

The overall project timeline is presented in Table 3. This time includes project planning and preparation, execution of the soil sampling campaign, with sampling, and related data gathering, analysis and reporting. Constraints on this schedule includes time required for initial documentation preparation, weather conditions impacting spring field preparation and planting, as well as factors governing the harvest and scheduling with the sampling contractor and analytical lab. The timetable is also constrained by the contractual obligations for the DEQ funding source. The intent of this project is to document a single growing season with the potential for follow-up to future growing seasons.

**Table 3. Project timetable.**

<b>Project Team</b>	<b>Initials</b>	<b>Activity</b>
Ed Hagan	EH	Program Manager
Amy Williams	AW	Project Manager, DEQ
Carolyn Firth	CF	Project Manager, ISWCC
Flint Hall	FH	Project QAO
Soil sampling Subcontractor	SC	Coordination/contact with producers, Soil sampling
<b>Estimated Dates</b>		<b>Tasks</b>
Mar 2017	All	Plan approval
Mar - Apr 2017	CF	Complete scope of work for sampling contractor
Apr 2017	CF	Work with contractor, local SWCC to identify producers and fields for inclusion in study, recruit participants
Apr – May 2017	SC,CF	Collect samples, submit to lab, CF- provide oversight
May 2017	FH	Field observation, audit
May – Aug 2017	CF	Receive questionnaires, Review soil analysis results
Aug – Nov 2017	SC,CF	Post-harvest sample collection, submit to lab, CF- provide oversight
Oct – Nov 2017	CF	Review soil analysis results, communicate to producers
Nov – Dec 2017	CF	Produce final report for DEQ
Dec 2017	AW, EH	Review and approve final report
Dec 2017	FH	Complete QA reporting and review

## 7 Quality Objectives and Criteria

This section of the project QAPP defines the project data quality objectives (DQOs), essentially defining the requirements to support the qualitative or quantitative design of the data collection effort. DQOs are also used to assess the adequacy of the data (new or existing) in relation to their intended use. Data quality indicators (DQIs) are used to describe, in part, the specific measurement elements to be used when evaluating data in support of the project DQOs. Project staff can find additional information and guidance concerning the DQO process and DQI selection and definition in the following reference materials:

- EPA *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA 2006c)
- EPA *Guidance for Quality Assurance Project Plans* (EPA 2002a)
- EPA *Requirements for Quality Assurance Project Plans* (EPA 2001).
- EPA *Guidance on Environmental Data Verification and Data Validation* (EPA 2002b)

The objective of quality assurance and quality control (QA/QC) is to ensure that analytical results obtained by soil sample analyses are representative of actual chemical and physical composition of the soil. Field QA/QC will consist of following a standard protocol for sample collection and collecting and analyzing sample duplicates/ replicates and performance evaluation (PE) samples or “known samples”. The duplicates are used to determine both field and laboratory precision. The PE samples will be “knowns” consisting of samples of local soil matrix analyzed by USDA, ARS, and provided to the sampler by ISWCC. Both the duplicate and PE samples will be stored and handled in the same manner as the normal samples, and submitted blind (without reference to their identity as QC samples). Project goals and sampling conditions do not require additional field QC samples. All QC samples will be submitted “blind” (i.e., not identified as a QC sample). Ideally, at least one set of field QC samples will accompany each sample shipment.

Field QC samples for this project will comprise at least 10% of all samples.

**Level I:** This refers to field observations, screening, assessments or analyses, including those using portable instruments, and results are commonly not compound-specific or quantitative. Generally, Level I data are related to activities such as locating sample collection points for laboratory analysis and are associated with instruments such as photoionization detectors (PIDs).

- **Generally associated verification/validation stage:** Level I may be associated, depending on data user requirements, with “Stage 1” verification and validation checks as described in Appendix B, Section 1.1, of EPA’s *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009).

**Level III:** This level refers to standard EPA-approved methods that may be equivalent to Level IV methods (see below), with the exception that the level of documentation supplied with analytical results is frequently less robust.

- **Generally associated verification/validation stage:** Level III may be associated, depending on data user requirements, with “Stage 2A” or “Stage 2B” verification and validation checks as described in Appendix B, Sections 1.2 and 1.3, respectively, of

EPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009).

Data collected in support of this project will consist of Field screening data (e.g., field measurements, assessment of soil properties – color, texture, moisture content, including results from participant questionnaire) and are considered data quality Level I (field parameter/screening level data).

Laboratory analytical data (i.e., data from samples submitted to a laboratory for analysis) are at data quality Level III (standard laboratory procedures and data reviewed by standard QA protocols).

## 7.1 Data Accuracy, Precision, and Measurement Range

**Accuracy** is a measure of the agreement between a “true” or reference value and the associated measured value. This sampling campaign will include spiked Performance Evaluation (PE) samples with a known matrix submitted blind to the laboratory. Recoveries of Laboratory Control Samples (LCS), and laboratory matrix spikes, and surrogate spikes may also be reviewed to evaluate the accuracy of the measurements. These recoveries are typically calculated as “percent recovery” (%R) represented by Equation 1 and Equation 2.

$$\%R = C_M / C_T \times 100$$

**Equation 1. Spiked sample or LCS percent recovery.**

Where:  $C_M$  = measured spike/LCS concentration  
 $C_T$  = true spike/LCS concentration

$$\%R = (C_S - C_{US}) / C_T \times 100$$

**Equation 2. Matrix spike and surrogate recoveries.**

Where:  $C_S$  = measured concentration of spiked sample  
 $C_{US}$  = measured concentration of unspiked sample  
 $C_T$  = true concentration of spike added

Laboratory accuracy for each analysis is determined through statistical analysis of the laboratory equipment by the laboratory; the acceptable accuracy range for the laboratory equipment will be indicated in the laboratory sheets. Any outliers from the acceptable range in percent recovery, as determined by the laboratory, will be flagged by the laboratory. Accuracy requirements for this project are  $\pm 20\%$ , and will be assessed from laboratory quality assurance information.

**Precision** is a measure of agreement between two measurements of the same property under prescribed conditions. Sampling campaigns may include duplicate samples (field replicates or split samples—see section 14) or may rely on LCS split sample results. The relative percent difference (RPD) of duplicate samples will be used to assess data precision. For laboratory duplicates, field duplicates, and matrix spike duplicates, Equation 3 will be used to calculate RPD:

$$RPD = \frac{(C_1 - C_2)}{(C_1 + C_2)/2} \times 100$$

**Equation 3. Relative percent difference (RPD).**

Where:  $C_1$  = concentration in first sample  
 $C_2$  = concentration in the second/duplicate sample  
Where both  $C_1$  and  $C_2 > 5$  times the laboratory method detection limit (MDL)  
Where one or both  $C_1$  and  $C_2$  are  $< 5$  times the MDL, the results will be considered within control limits where  $C_1$  and  $C_2$  are  $\pm$  MDL.

Precision will be based on field duplicates and “known” samples with an RPD goal of  $\pm 20\%$ .

Appropriate **measurement range** is determined by reviewing results with comparison to the laboratory reporting levels or MDLs. Reporting requirements are determined prior to sampling through review of historical data for the analytes and region of interest and reflected in choice of analytical laboratories, analysis methods, and requested reporting levels or MDLs.

## 7.2 Data Representativeness

Representativeness is the degree to which the sample data accurately and precisely represent site conditions. The representativeness criterion is best satisfied by confirming that sampling locations are properly selected, sample collection procedures are appropriate and consistently followed, a sufficient number of samples are collected, and analytical results meet data quality objectives. All sampling procedures will follow the sampling procedure in Appendix D. Representativeness is evaluated during data review, verification, validation, and reconciliation efforts by comparing the combination of data accuracy, precision, measurement range, and methods and assessing other potential sources of bias, including sample holding times, reported results of blank samples, and laboratory QA review.

## 7.3 Data Comparability

Comparability is the confidence with which one data set can be compared to another data set. Using standard sampling and analytical procedures will maximize comparability. To ensure data comparability, sample collection procedures (included in Appendix D) will be consistently followed, appropriate analytical procedures will be used, and the same laboratory will be used to analyze the samples for pre-fertilization and post-harvest throughout each project. Sample collection, handling, and analysis methods will be constant with similar projects such as the Yakima Lower Yakima Valley deep soil sampling project, and Shoshone-Bannock deep soil sampling project.

## 7.4 Data Completeness

Completeness is the percentage of valid data relative to the total possible data points. For data to be considered valid, it must meet all of the acceptance criteria, including accuracy and precision, and any other criteria specified by the analytical method used. The overall data quality objective for completeness for the sampling events conducted under this QAPP is 80%, based on the number of producers and fields contacted for sampling verses the number of fields with valid sample results. If the sampling event does not meet the quality assurance goal of 80%, the data will be discussed with the program manager and a course of action agreed upon. Any required departure from this goal will be justified and explained in the project records in accordance with the QMP.

## 8 Special Training/Certification

All specialized or non-routine training, qualifications, or certifications necessary for project and/or laboratory staff is listed below.

The project manager is responsible for ensuring that personnel assigned to this project are appropriately trained and qualified, with the appropriate training records on file with DEQ human resources.

All work performed by DEQ personnel will be conducted in accordance with the *Idaho General Safety and Health Standards* (Division of Building Safety 2006).

Field sample collection will be accomplished by a subcontract. That subcontractor will have all applicable certifications and will conduct their work according to standard operational and safety practices.

- No specialized or non-routine training for soil sample collection associated with this project is required; DEQ and ISWCC staff will be familiar with applicable methods and SOPs as referenced in this QAPP.

## 9 Documentation and Records

Project Quality Assurance documents and final reports will be filed electronically in TRIM in accordance with applicable program filing procedures. The project manager is responsible for ensuring that a copy of the current approved (and signed) project QAPP, with related FSPs and standard operating procedures (SOPs), is available in the DEQ TRIM electronic records management system. A copy of the signed signature page for the project QAPP and FSP (if used) is to be filed in the TRIM system by the project manager. Preferably, the approved document, including the signed signature page, is attached to the TRIM record in PDF format. Field data collection, soil sample results and producer questionnaires will be maintained by ISWCC and will not be included in DEQ record keeping.

Field personnel shall use the field data collection forms included in Appendix A to document each day's activities. An additional field log book may be utilized to record pertinent information not captured in the provided data collection forms. Information is to be recorded as follows:

- Project data must be recorded directly, promptly, and legibly.
- Field logbook or field sheet entries must be made in black or blue permanent ink and must be signed/initialed and dated by the person making the entry.
- Changes or corrections to field logbook notes and/or data must be indicated with a single line through the original entry. Changes must be initialed, dated, and explained. A field sheet may be discarded and information reentered on a new data sheet if needed.

All documentation necessary to support the objectives of the project and the validity of project data— field records including grower questionnaire, chain-of-custody forms, laboratory reports, field notes, field logbooks, etc., and QAPP, FSP, audit reports—shall be retained. The QAPP, any FSP developed, Annual project audit and assessment documentation, per the DEQ QMP, shall also be entered into the DEQ TRIM document system by the project QAO and/or the project manager, as applicable in accordance with the current approved DEQ records retention schedule (TRIM record #2010AIC3). Field records will be maintained by ISWCC in an appropriate manner that maintains data integrity and meets security and retention set forth in the Idaho Soil and Water Conservation Commission Records and Retention Manual.

## **10 Sampling Process Design**

The intent of sampling is to provide for agricultural producers a correlation between nutrient management practices for specific fields and potential ground water quality impacts. The design presented for this sampling provides a template that may be applicable in other regions for addressing the question of residual soil nitrates following a growing season.

Sample design includes rationale for site selection and a structure for sample project design and management. Rationale for sample site selection, identification, handling, analysis and reporting is presented in the following sections.

### **10.1 Rationale for Selection of Sampling Sites**

Grower participation is voluntary and will be solicited by general mailings and outreach by the ISWCC, local conservation districts, and the Cassia/Minidoka Ground Water Quality Improvement committee and the Twin Falls Ground Water Quality Improvement committee. Growers will be encouraged to participate and to propose fields for sampling.

Selected fields will be chosen to provide a representation of crop and field conditions within the nitrate priority area and field-specific data including application of animal waste and/or commercial fertilizer. The total number of sites is constrained by the available budget, grower response, and timing and availability for sample collection.

Locations for sampling will be constrained by proximity to Nitrate Priority Areas and modeled model ground water source delineations produced by DEQ. Fields selected for soil sampling will be located within or near (1/4 mile) of an identified ground water source delineation as determined for Source Water Assessments (SWA) and within or near (1/4 mile) of the Marsh Creek, Minidoka, or Twin Falls NPAs. A goal of 60 fields for soil sampling is set for the 2017 growing season. These should be distributed approximately equally for the Marsh Creek NPA in

Cassia County, the Minidoka NPA in Minidoka County, and Twin Falls NPOA in Twin Falls County – 20 sites per NPA/County. Maps of the referenced NPAs, counties with corresponding SWA ground water delineations are presented in Appendix A. In addition to the planned number of sample sites per NPA, 2 duplicate locations and one PE (Performance Evaluation, also known as “spiked” or fortified) sample will be collected for each of the NPA/Counties – a total of 3 quality control (QC) samples per NPA/County, and 9 QC samples overall.

## 10.2 Sample Design Logistics

Sampling logistics for this specific project are presented in this QAPP. Sampling logistics for possible future sampling may be detailed in monitoring campaign specific Field Sample Plans that may be developed.

Specific producer/growers will be contacted by ISWCC based on input from the identified partners in Section 6.1, Item 1, and meeting the location criteria presented in Section 10.1. Those producers/growers agreeing to participate will be contacted by the soil sampling contractor and scheduled for sampling. ISWCC will provide the Deep Soil Sampling Program Questionnaire (Appendix A) to complete and return by mail to the ISWCC.

Site identification record keeping is designed to preserve to the degree possible confidentiality of the producer. The sampling contractor will provide each participant with a Unique Identification Number (UIN), generated at the time of sample collection following the pattern established by the ISWCC:

**CC – SS**

Where:

**CC** – Idaho county FIPS code: Cassia Co – 31, Minidoka Co – 67, Twin Falls Co - 83

**SS** – Serial site number; ex. 01, 02, 03 . . .

The UIN serial number will increment by 1 for each field. A grower/producer that has two fields will have consecutive UNI numbers: ex 31-01, 31-02 – if in the same county, or the next available serial number if fields in different counties are sampled. UIN numbers will be recorded on the Deep Soil Sampling Questionnaire and Sampling Field Form. A complete table of Idaho FIPS codes (Table B1) is included in Appendix B.

A sample site identified as a “duplicate” site will be assigned serial site numbers SS = 31 or 32. Samples submitted as PE sites will be assigned SS=33.

Sample identification for record keeping and custody control will use an indexing system based on the UIN described and a serial sample number per field based on sample depth interval. The following pattern for field sample number will be used:

**UIN – DD**

Where:

**UIN** - (CC – SS for the sample site)

**DD** – Representative depth interval:

0-1 ft – 01, 1-2 ft – 02, 2-3 ft – 03, 3-4 ft – 04, 4-5 ft – 05, 5-6 ft – 06

The sample number will be recorded on the Sampling Field Form, Sample Chain of Custody (COC) record, the Agricultural Soil Submission Form (laboratory request for analysis form), and on the individual sample container for that specific sample.

## 10.3 Sampling Schedule

The ISWCC and the producer will coordinate the sampling schedule for each field based upon the anticipated harvest date for the crop in that field the year of sampling. Samples will be taken as soon after harvest of the respective crop as possible (late summer and fall) and will be completed prior to: 1) Fall application of nutrients. 2) Irrigation to establish fall seeded crops. 3) Fall precipitation, as possible. Each sampling site will be sampled for baseline purposes once each year for the duration of the project, unless additional soil sampling is requested based on review of data by the producer or the ISWCC. Recent crop, nutrient, and irrigation actions will be recorded by Sampler.

## 11 Sampling Methods

### 11.1 Rationale for Selecting Soil Sampling Sites

The intent of soil sampling for this project is to assess generic field conditions for the purpose of surveying the effects of management practices employed by individual growers/producers. The ISWCC understands that it would be cost prohibitive to characterize each field to a level of detail necessary to identify all the variability within a field or to accurately quantify field-level leaching estimates. Sampling sites will therefore be selected to measure effects of management practices for the field conditions.

Sample sites within a selected field will be selected recognizing the following two expected sources of sample variability within that field:

**Generic Variability:** Generic conditions exist which create variability in all fields. Examples include field border effects, cultivation patterns, and position relative to an irrigation system. A

minimum of 100 feet shall be established as a setback from field edges, field entry points, water features such as ditches, ponds, waterways or drainage ditches, etc.

**Field Specific Variability:** Factors that cause field specific variability include soil type, topography, and management practices. Selecting a sample site with relatively uniform conditions will be the responsibility of the contract sampler and the grower. While resources are available to aid the grower, most growers have intimate knowledge of their fields and are best suited to select the locations of average field conditions. The contract sampler insures that sampling sites will be representative of the field or management unit being sampled.

Specific soil sample locations will be determined with input from the grower, the sampler and the ISWCC representative. Detailed soil survey maps and interpretations will be generated by the ISWCC using a USDA published or online soil survey for each field as further guidance for specific site selection. The sampling zone will be located on the soil survey map within the predominant soil type(s) of the field deemed to be representative of the management program and physical attributes of the field.

## 11.2 Definition of Terms Pertinent to Soil Sample Collection

Standard soil sampling methods rely on specific terms to guide sample collection. The soil sampling contractor will adhere to the following definitions for these pertinent terms:

**Borehole:** A borehole represents the point at which soil samples are obtained, one for each selected site. Six discrete soil samples are collected from each borehole, discrete samples being taken at the designated depths. Samples from the same depth for each of the 5 boreholes are mixed together to form a composite sample. Boreholes may be advanced by any method capable of collecting discrete samples over 1-ft intervals at the prescribed depths. Mechanized (e.g. pneumatic, hydraulic) sampling devices are required.

**Composited One-foot Sample:** Soil samples that represent each one foot sampling depth, mixed together to form one consolidated sample. A sample of the consolidated sample will be selected and provided to the laboratory for analysis.

**Conservation Planning or Field Location Maps:** Aerial photographs used for conservation planning purposes which are generally included in the producers' field specific conservation plan will be used to identify the location of selected fields in relation to the rest of the operating unit.

**Discrete Sample:** A one foot soil sample for each of the sampling depths retrieved from a borehole, prior to compositing.

**Published Soil Survey Descriptions:** Data and descriptions which identify and describe soil mapping units included on published soil survey maps.

**Published Soil Survey Maps:** Maps generally included in the producers conservation plan which delineate soil texture boundaries within a field. Maps are generated using USDA NRCS published soil survey data.

**Sampling Setbacks:** Those areas of the field that are automatically determined to be not representative of the average field condition and therefore inappropriate for sampling. Examples include field borders, first span of a center pivot, field entry points, and harvest haul roads.

**Sampling Site:** Five sampling sites will be selected within the Sampling Zone. The Sites will be located within the soil type of the field and deemed to be representative of the physical attributes of the field including soil texture, irrigation type, slope, water table, etc.

**Sampling Zone:** The field area available for sampling after the setbacks described above are taken into account.

### 11.3 Soil Sample Collection Methods

The soil sampling contractor will follow industry standard, direct-push, continuous sample collection methods utilizing a mechanized sampling tool (e.g. Giddings, AMS, GeoProbe) that can collect soil from discrete one-foot increments without cross contamination. Samples will be collected and information recorded following industry standard methods.

For each sample site, five continuous bore samples each representing 6 discrete, one-foot samples per bore will be collected, with a minimum of four boreholes within each sample site if limited by conditions. The minimum nominal diameter of the standard cores shall be approximately 1 ¾ - 2 inches; however, if refusal below a depth, as small as a 1-inch diameter core may be used. If refusal occurs prior to 6 feet, the sampler will record sampling depths that were reached and samples collected for that site on the Soil Sampling Field Form (Appendix A).

The discrete one foot samples from each borehole will be placed in clean plastic buckets (one for each depth interval) then mixed to consolidate the soil into one representative, composite one-foot sample to be analyzed. After compositing, a portion of soil in each quadrant of the bucket will be transferred to a lab-prepared sample bag. The sample bag will be clearly marked with the date and time of collection, the sampler's initials, and the sample identification number. Detailed soil survey maps and interpretations will be generated by the ISWCC using a USDA published or online soil survey for each field selected for the project. The sampling zone will be located on the map within the predominant soil type(s) of the field deemed to be representative of the management program and physical attributes of the field. The soil type will be identified on the Soil Sampling Field Form

If boreholes terminate at different depths, composite samples will be created by compositing available discrete samples (which may number less than four). During boring and soil collection, care should be taken to avoid mixing the soil from discrete one-foot depth increments with soils from shallower or deeper depths.

Following satisfactory collection of samples, boreholes will be backfilled by the sampler using tamped native soil to prevent creation of a vertical conduit.

## 11.4 Soil Sample Data Collection and Record Keeping

Project field information will be captured on the appropriate field forms (Appendix A). The soil sampling contractor will be provided with the Deep Soil Sampling Release Form, Deep Soil Sampling Program Questionnaire, Soil Sampling Field Form, Chain of Custody (COC) record and laboratory soil analysis forms. The soil sampling contractor will assign a UIN for each grower/producer and field sampled from a list of available numbers at the time of sampling, based on the appropriate county FIPS and serial site number. The soil sampling contractor will not maintain a correlation between the grower/producer contact information and the UIN. The grower/producer will be able to use this UIN to access their soil sampling results when available. Original copies of the release form, sampling program questionnaire, and field sample forms will be maintained by ISWCC, with the assigned UIN recorded on each. Original copies of the agricultural soil submission form and COC forms will be maintained by the analyzing laboratory and made available as per standard practice.

Variations on this or other aspects of the sample collection process can be updated in a FSP for future sampling campaigns.

QA/QC procedures as specified for sample collection will be followed by sampling personnel. The QA/QC procedures will be fulfilled by adhering to all requirements detailed in this QAPP. Such adherence will be demonstrated through appropriate documentation of sampling procedures within the field logbook or field sheets as described herein. Field audits by the project QAO may also be part of QA/QC procedures.

## 11.5 Safety and Liability

Because of the proposed sample depths, samplers should use mechanized sampling equipment, which is inherently dangerous. In addition to physical hazards of the equipment itself, there is the potential to intersect power and other utility lines that may lie above or beneath a sampling site. The sampler must call the utility notification center (information at <http://www.callbeforeyoudig.org> ) and leave sufficient time for their response prior to field work. The grower must identify and record the location of utilities on private land and flag/stake any underground utilities in the field that are within 200 feet of the agreed sample site. Responsibility for personnel safety will reside with the sampling company. The sampler is responsible for damage to property of the cooperating grower caused by field sampling which is the result of negligence of the sampler. Property damage caused by negligence on the part of the sampler will be repaired by the sampler.

The grower/producer will agree to release ISWCC and the soil sampling contractor from liability for any damages, losses, or expenses arising from inaccurately identified locations for any underground private utilities, including but not limited to irrigation mainline, electrical lines, or any other structures.

## 12 Sample Handling and Custody

Soil samples will be delivered by contracted samplers to a contracted commercial laboratory or prearranged drop-off location. Sampling handling procedures as described in University of Idaho Bulletin 704 (Appendix D) (<http://www.cals.uidaho.edu/edComm/pdf/EXT/EXT0704.pdf>) will be followed to insure that sample collection, holding and preservation time requirements are met. Coordination will be made with the laboratory prior to sample collection. For delivery to the lab, samples shall be placed in a cooler with reusable ice substitutes or with ice. If ice is used, sample containers must be placed inside a waterproof bag to prevent contact with melting ice. At no time shall the sampler store samples for more than 48 hours. Samplers may dry samples using methods acceptable to the laboratories and consistent with analytical methods. If the laboratory cannot analyze the sample within 48 hours of sample collection, the laboratory must preserve the samples by methods acceptable for the analytical method and standard practice.

The sampler will complete an Agricultural Soil Submission form approved by the analyzing laboratory for sample from each site and a COC record (Appendix A) for sample shipment. The soil submission form will include contact and billing information for ISWCC (not the grower/producer) and pertinent sample-specific information – sample identification number and the UIN corresponding to the producer/grower and specific field. The COC will include the project name, UIN, field sample number, sampled depth interval and sampled date for each sample. The date and time that the sample relinquished custody, and samplers name/initials will be recorded on the form. Custody is relinquished when the sampler or their agent releases the sample container or cooler to a designated intermediary or common carrier for shipment to the laboratory, or directly to the analyzing lab. The lab will return the original copy or scanned image of the COC at sample receipt or with reporting of results, indicating the time and date of sample reception, with the receivers name. ISWCC will maintain a record of sample custody with their field records.

## 13 Analytical Methods

Samples collected will be analyzed by a laboratory meeting ISWCC requirements; participation in the North American Laboratory Proficiency Testing Program (NAPT) and NAPT's Proficiency Assessment Program (PAP) for the requested methods. Table 4 lists the requested parameters, reporting units, methods and method descriptions.

**Table 4. Parameters, Units, Analytical methods, and Method Descriptions.**

Parameter	Units	Analytical Method	Method Description
pH	Unit	S-2.10	1:2 Soil:Water Ratio
Soluble Salts	mmhos/cm		
Organic matter	%	S-9.10	LOI- Loss of Ignition
Lime	%	Fizz	Effervescence 2N HCl
Cation exchange Capacity - ECE	meq/100g	S-10.20	Measured
Nitrates – NO <sub>3</sub>	ppm	S-3.10	Cadmium Reduction/KCl Extraction - FIA
Ammonium – NH <sub>4</sub>	ppm	S-3.50	KCl Extraction/Exchangeable FIA
Potassium, Calcium, Magnesium, Sodium, Sulfate	ppm	S-5.10	Ammonium Acetate - ICP
Total Phosphorus	%	P-4.10	Nitric Acid/Peroxide Wet Ash
Zinc, Iron, Manganese, Copper	ppm	S-6.10	DTPA Extractable - ICP
Boron	ppm	S-6.10	DTPA Extractable/Sorbitol - ICP

*Notes:* mmhos/cm = micromhos/centimeter, ppm = parts per million, meq/100g = milliequivalents per 100 grams

FIA = Flow Injection Analysis, ICP – Inductive Coupled Plasma

DTPA = Diethylenetriaminepentaacetic acid

KCl = potassium chloride,

HCl = hydrochloric acid

## 14 Quality Control

Generally speaking, quality control is a means of measuring or estimating the potential variability involved with sample collection, analysis, or measurement activities in the field and in the laboratory. This section will discuss the various QC activities associated with this project

Adherence to this plan provides the framework to maintain quality control for the project. Quality assurance samples shall be analyzed and the results reported to ISWCC. The ISWCC contract with samplers and laboratories will allow the ISWCC to discuss results with the samplers and laboratories to determine the cause of potential problems and for development of corrective actions to address any irregularities with the result or entire sample collection and analysis process. Laboratories will perform standard internal quality control measures and will make available associated quality control information as needed.

Standard field quality assurance practices will be employed including duplicate/replicate and PE (fortified or “spiked” samples). Duplicate/replicate and PE samples will be submitted “blind” (not indicated as a QC sample)

### 14.1 Field QC Checks

Field QC samples, (duplicates and PE samples) will be submitted blind (not identified as a QC sample) for analysis. The overall field QC frequency will be at least 10% of the samples. Submission of QC samples will be scheduled to ensure that at least three PE samples or a set of duplicate samples will be included with each shipment of samples submitted to each laboratory. Field QC sample collection will be as evenly distributed as project conditions allow.

#### Duplicates

Duplicate samples are two samples collected from the same location, representing the same sampling event, and carried through all assessment and analytical procedures in an identical manner. Duplicates for this sampling project will consist of “splits” (subsamples drawn from the same initial volume of matrix). Sampling procedures outlined in Appendix D will be followed for each sampling event to ensure consistency in sample collection. All relevant information will be recorded for the duplicates, just like the normal samples, in the field logbook or field sheet. Results from the field duplicate analysis will be included in the analytical report.

#### Field, Trip, and Equipment Blanks and Field Spikes

A blank is a sample of known matrix where the specific constituents requested for analysis are known to be absent or are present at concentrations less than the laboratory minimum limit of detection.

**Field blanks** are samples of blank matrix prepared in the field under identical conditions, processed the same, and included for analysis as a regular sample. Field blanks are a QC check to identify potential problems with the sample collection, handling, and analysis process. Field blanks will not be included for this project.

**Equipment blanks** are blank sample matrix passed through or over non dedicated sampling equipment to check the decontamination process between samples or sample sites. Equipment

blanks may be collected when sampling equipment requiring decontamination (e.g., portable sampling equipment, mixing buckets, sampling shovel) are carried from field to field. When collected, equipment blanks will also be submitted blind for analysis and may be included in the overall 10% QC sample calculation. No equipment blanks will be required for this project. Soil sampling probe will be decontaminated by brushing clean of soil between borings. Sampling buckets for compositing samples will be cleaned between use and depth interval.

**Field spikes** are samples from a third-party vendor that include a known concentration of analytes of concern and may be submitted blind to the analyzing laboratory. These “spiked” samples may be included in the sample shipment to allow for an independent accuracy assessment or for inter-laboratory comparisons. Three PE “known” samples will accompany each sample shipment. PE samples will consist of local soil matrix analyzed by the ARS laboratory, Kimberly Id, for blind submission with field samples.

## 14.2 Laboratory Quality Control Checks

Laboratory QC checks are routinely performed as part of the analysis process. The frequency and type of QC samples are often analysis method-dependent and include reagent blanks, matrix spikes, and internal laboratory splits. Analyzing laboratories will report any variance from QC limits impacting the quality of sample results and may report details of internal laboratory QC if requested. The analytical laboratory may provide appropriate sample containers, COC forms, sample labels as used, and any necessary container seals. A summary of laboratory QA/QC and data reports will be included in the final report submitted to DEQ and filed in TRIM.

Laboratory QC checks include internal checks for sample analysis activities, duplicate samples, and blanks. The following paragraphs describe common components of laboratory QA/QC programs.

### Laboratory Blanks

A laboratory blank is a sample of known matrix where the specific constituents requested for analysis are known to be absent or are present at concentrations less than the laboratory minimum limit of detection. The laboratory blank is analyzed to evaluate the accuracy of the analysis.

**Laboratory control samples** (LCSs) are samples that contain a known concentration of analytes and are analyzed to assess the overall method performance. They undergo the same preparatory and determinative procedures as the project samples and are the primary indicator of laboratory performance. LCS recoveries are used to measure accuracy. The RPD for duplicate LCS recoveries is used to measure precision.

A **laboratory duplicate sample** is a sample that is split by the laboratory into two separate and identical samples. The two samples are analyzed and a comparison of the results (RPD) is used to assess laboratory precision.

A **matrix spike** (MS) sample has a known amount of the target analyte added to project matrix before analysis to assess possible matrix interferences on the analysis. Percent recoveries on MS samples should be compared to percent recoveries of LCS samples. An **MS/matrix spike duplicate** (MSD) pair can be used to assess precision.

### **14.3 Data Analysis Quality Control Checks**

The QC check data may be checked/reviewed for quality by the project manager or the project QAO at any time during the project and must be checked after all of the data are collected. Corrective actions, as needed, will be documented in the event that control limits are exceeded. Data qualifiers will be assigned following appropriate data verification/validation procedures. Any qualifiers added will be defined in the project summary/technical report and will be consistent with EPA QA/G-8 (EPA 2002b). The following checklists are included in Appendix C: Data Review—TRIM record #2012AEB2, Data Verification—TRIM record #2012AEB3, Data Validation—TRIM record #2012AEB4, and Project QAO Annual Audit— TRIM record #2012AEB5

## **15 Instrument/Equipment Testing, Inspection, and Maintenance**

Laboratory instrument/equipment testing, inspection, and maintenance are performed and documented by the laboratory if/as required by the State of Idaho laboratory certification process. Procedures and schedules for preventive maintenance of sampling equipment are the responsibility of the laboratory. Each instrument or item of laboratory equipment will be maintained periodically to ensure accuracy. These procedures and frequency of performance are designated in the individual instrument manuals.

Project field instrument/equipment testing, inspection, and maintenance will be performed in accordance with the individual instrument/equipment manual.

## **16 Instrument/Equipment Calibration and Frequency**

Laboratory instrument calibration is conducted and documented by the laboratories if/as required by the State of Idaho laboratory certification process.

Any field monitoring equipment utilized for the measurement of field parameters will be calibrated and maintained as recommended by the manufacturer, or as found in individual instrument/equipment manuals, to ensure accuracy within specified limits. Calibration details will be recorded in the field logbook or field sheet. Field equipment used to collect samples will be calibrated according to manufacturers' procedures or internal guidelines at the start of each field day (at a minimum) and/or at intervals recommended by the manufacturer or found in individual instrument/equipment manuals. Each instrument or item will be visually inspected by field sampling personnel for damage and operability prior to each sampling event.

## **17 Inspection/Acceptance of Supplies and Consumables**

The supplies and consumable items required for monitoring projects will be consistent with the appropriate sample collection procedure described in this document or included in Appendix D. All sample containers will be obtained from or approved by the the analytical laboratory,

laboratory supplier, or laboratory equipment provider. All sampling supplies and consumable items will be new, inspected for acceptance by the project manager prior to use, and used for sampling as per the approved procedure.

## 18 Nondirect Measurements and Data Acquisition

Nondirect measurements and data acquisition refer to data obtained *for use by the project* from existing data sources, not directly measured or generated in the scope of this project. This type of data is often referred to as “existing data.” Examples of this type of data include data obtained from existing sources or databases (either from within or from outside DEQ or ISWCC) and data obtained by others and offered or presented to DEQ or ISWCC.

Published Soil Survey Descriptions and Soil Survey maps are examples of these nondirect measurements and data use within this study. Soil Survey descriptions identify and describe soil mapping units included on published soil survey maps. These descriptions are used to delineate soil texture boundaries identified on soil survey maps generated using USDA NRCS published soil survey data. These data are used as guides to sample site selection as described in Section 10 – Sampling Process Design.

## 19 Data Management

Documentation of field and laboratory work for each soil sampling site will consist of submittal of the following documents to the ISWCC by the soil sampling contractor:

- A completed Sampling Field Form (Appendix A).
- Copies of soil survey maps and interpretive descriptions prepared or compiled by ISWCC, notes or related information collected by the sampler during the sampling process.
- A copy of the analytical results shall be made available to the grower/producer and provided to the ISWCC. All forms and related information will be maintained by the ISWCC to insure that minimum records necessary for technical analysis of the data, documentation to facilitate repeat sampling, and possible audit of financial data are available.
- The completed Grower Agreement, and Deep Soil Sampling Program Questionnaire.

The analyzing laboratory will make soil sampling results available to the ISWCC and the grower/producer thorough a secure web interfaced. The ISWCC will analyze soil test results and provide the grower any summary, direction or recommendations as deemed necessary by the ISWCC.

The ISWCC will summarize soil sample data for all samples taken during the year and provide DEQ the cumulated results identifying resource concerns and outlining intended remedial action.

The ISWCC will enter sample and analytical data into a computer database. Computerized data will include technical data necessary for interpretation of the results by the project. Such data will include sample ID, sample depth; sampling date; analytical results; and Soil Sampling Field Form (Appendix A).

Quality Assurance forms as completed: Data Review—TRIM record #2012AEB2, Data Verification—TRIM record #2012AEB3, Data Validation—TRIM record #2012AEB4, and Project QAO Annual Audit— TRIM record #2012AEB5 will be entered into TRIM as part of the DEQ QAPP recordkeeping.

## **20 Assessment and Response Actions**

Assessment of the project QAPP will be performed by ISWCC assessment of field notes and laboratory reports and by conducting field and laboratory audits where possible and resources allow. This assessment will be completed or directed by the QAO. Any errors or inconsistencies identified in the field notes will be discussed with ISWCC and corrective action suggested. The QAO will perform assessment of the project independently of the project manager.

A note to the file will be included with the field notes and laboratory reports if any follow-up QA activities regarding field notes or laboratory reports are required and conducted.

The QAO shall audit the QAPP annually for project that continue beyond one field season, per the DEQ QMP, to determine if revision is necessary. The project manager should also review the project QAPP on an annual basis to ensure that the document continues to meet the needs of the data user(s). Audits and reports shall utilize the appropriate checklist forms located in Appendix A and will be documented in TRIM, indicating the date of the audit and listing identified issues or concerns in accordance with the QMP. If the project QAPP and/or FSP requires revision as a result of this audit or review, these actions will be taken and the revised QAPP submitted for approval prior to implementation, per the DEQ QMP (DEQ 2012a).

## **21 Reports to Management**

As part of funding contract fulfillment for DEQ subcontract S544 (TRIM 2016AHR276), ISWCC will submit a final report including the following deliverables:

- A description of the project,
- A description of sampling procedures and protocols,
- A detailed table showing soil analysis results, cropping history, and fertilizer applications for each field sampled, and
- A summary table showing ranges of nitrate values and other parameters.

## 22 Data Review, Verification, and Validation

**Data review** will be conducted by the ISWCC Project manager and deliverables to DEQ will be performed by the DEQ Project manager

**Data verification** will be conducted by the ISWCC Project manager and deliverables to DEQ will be performed by the DEQ Project manager with support of the Project QAO as needed.

**Data validation** shall be conducted by the project QAO following data review and verification

**Data review, verification, and validation tasks are assigned to specific project staff, such as the project manager or project QAO, in section 23 of the project QAPP.**

The level of documentation required for a specific project data review, verification, validation, and reconciliation effort is specified below. This level of documentation is determined by the project manager, in consultation with the regional or program manager, consistent with the “graded approach” used by DEQ in implementing the quality management system (QMS).

Those assigned to perform project data review, verification, and validation *shall use the associated checklist provided in the appendices to perform and document* the effort in the associated project TRIM file system.

## 23 Review, Verification, and Validation Methods

Data review, verification, and validation efforts are based on the analytical support determined to be necessary in the planning stages of the project. DEQ personnel performing data verification and validation are encouraged to review the following guidance documents:

- EPA QA/G-8 (EPA 2002b) for guidance on methods for this task.
- Appendix A of EPA’s *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009)
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA 2004).
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (EPA 2008).

**Data review** for data and information collected under this QAPP shall be performed by the project manager(s) using the data review checklist found in [Appendix C](#). This review will also include evaluation of supplied laboratory data reports. Data review will include the following activities, at a minimum:

- An examination of project data, identifying errors in data entry, storage, calculation, reduction, transformation, or transcription.
- An examination to ensure all required sample information is documented and available, in preparation for the verification, validation, and assessment process. This includes pertinent project information concerning blanks, matrixes, temperature requirements, duplicates, preservatives, shipping dates, holding times, chain-of-custody records, etc.

- An examination to identify if all required nondirect measurement data (existing data) information *and supporting documentation*, as required by the project QAPP, have been received and are available for the verification and validation process.
- A completeness check to determine if any data deficiencies exist, such as missing data or compromised data integrity, due to issues such as loss in acquisition, storage, or processing.
- An examination to ensure all necessary analytical laboratory support documentation, as set forth and stipulated in the project QAPP, have been received from the applicable laboratories.
- An examination to identify programming and/or software related errors, if applicable to the project.

**Data verification** for data and information collected under this QAPP shall be performed by the project manager(s) using the data verification checklist found in [Appendix C](#). The general focus of the process is to identify if all requirements specified in the project QAPP, associated procedures, and project contractual requirements (if applicable), have been met, and if not, to determine the extent to which requirements failed to be achieved. Data verification will include the following activities, at a minimum:

- Verification that all data completeness criteria, as stated in the project QAPP, have been satisfied. This shall include items such as the number of samples, number of QC samples such as spikes and duplicates, and chain-of-custody record continuity.
- Verification that the values of individual data points, and/or comparison calculations such as RPD, meet the criteria specified in the QAPP.
- Verification that the required analytical methods, as listed in the project QAPP, correspond to the analytical methods employed by the laboratory, as recorded in laboratory reports.
- Verification that QAPP requirements relative to laboratory analytical support documentation have been satisfied by the reporting laboratory, including the correct application of data qualifiers.
- Verification that all supporting information and documentation for nondirect measurement data (existing data) meet the requirements of the QAPP. If not, identify any limitations or restriction on the use of such data.
- Verification that data and sample collection practices adhered to procedural requirements, to include a review of project logs and field notes, as applicable.
- Verification that sample handling activities conform to QAPP requirements. Examples include sample shipment timelines, sample holding times, preservatives, number of samples obtained, duplicate or split sample frequency, and chain-of-custody documentation.
- Verification that data calculation and handling activities conform to QAPP requirements. Examples include correct use of mathematical formulas and numerical methods, correct use of programs and programing, and correct application of database information transfers.
- Verification that any remaining or unique project QAPP or procedural requirements have been met, and if not, determine the extent to which these requirements failed to be achieved.
- Determine and document any limitations on the use of the project data.

**Data validation** for data and information collected under this QAPP shall be performed by the project QAO using the data validation checklist found in Appendix C. The general focus of the process is to identify if the quality of the project data meets the needs of the data user and the associated decision makers. The data validation effort for this project shall include a minimum of 10% of all project data with a goal of 20%, except as noted specifically below. Data validation will include the following activities, at a minimum:

- An evaluation and examination of all (100%) of obtained field QC sample results, such as duplicates and trip blanks, etc., followed by assignment (if necessary) of appropriate data qualifiers to these data based on project criteria.
- A review of project analytical laboratory reports and data, including the assigned data qualifiers, to evaluate the data quality with respect to the project DQOs. Assign data qualifiers to individual data values as necessary and appropriate.
- A review of the outcome of the data verification effort to evaluate the impact on data quality with respect to the DQOs.
- A determination, when necessary and where possible, of the reasons for any failure to meet methodological, procedural, or contractual requirements and an evaluation of the impact of such failure on the overall data.
- A comparison of the project DQOs, as defined in the project QAPP, to the data obtained by the project to assess the adequacy of the data (new or existing) in relation to their intended use.
- A determination of the extent to which any nondirect measurement data (existing data), and the accompanying supporting information and documentation, meet the requirements of the data user. Specifically, does the quality of the existing data adequately support the needs of the project and support the intended use of the data for the project.
- Determine and document any limitations on the use of the project data.
- Determine the adequacy of the data to proceed on to the data assessment and reconciliation with user requirements phase.

Any potentially unacceptable departures from the requirements of the project QAPP will be noted during the data review, verification, and validation process. If the project manager or the project QAO determines the data do not meet the needs of the project or the DQOs of the QAPP and/or if the conclusions drawn from the data do not appear to be reasonable, the project manager and the QAO shall immediately report such findings to the appropriate regional manager and/or State Office program manager to determine the necessary corrective actions. Documentation of such findings and activities shall be maintained in accordance with the DEQ QMP.

## **24 Reconciliation with User Requirements**

Data quality assessment (DQA) will be performed in accordance with this QAPP and the DEQ QMP (DEQ 2012a). Additional guidance for conducting data assessment can be found in EPA QA/G-9R or EPA QA/G-9S (EPA 2006a, b).

The DQA will be performed (at a minimum) by the project manager and the project QAO to determine if the project data set is of the right type, quality, and quantity to achieve the objectives of the project and can confidently be used to make an informed decision.

Information and findings associated with the project data review, verification, and validation efforts shall be considered during the data assessment process.

When DQOs are not met, the project manager will discuss appropriate corrective actions with project staff, project management, and with the analytical laboratory. Corrective actions may be initiated to suggest improvements to data collection activities, data and sample handling techniques, internal laboratory quality procedures, etc., to solve quality issues.

If the project manager or the QAO decide the project data do not meet the project needs or the QAPP quality objectives and/or if the conclusions drawn from the data do not appear to be reasonable, the project manager and the QAO shall immediately report such findings to the appropriate regional manager and/or State Office program manager to determine and document the necessary corrective actions.

If sampling activities require revision, the project QAPP and/or FSP will be revised as necessary. Following revision, and prior to implementation, the revised project QAPP and/or FSP must be re-approved in accordance with the DEQ QMP (DEQ 2012a).

## 25 References

- DEQ (Idaho Department of Environmental Quality). 2012a. *Quality Management Plan*. Boise, ID: DEQ. TRIM record number 2012AEC1. Available at <http://insidedeq.deq-intra/director/documents/quality-mgmt-plan-rev-3-2012.pdf>.
- DEQ (Idaho Department of Environmental Quality). No date (current version). "Retention Schedule." Boise, ID: DEQ. TRIM record number 2010AIC3.
- EPA (US Environmental Protection Agency). 2001. *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5). Washington DC: EPA, Office of Environmental Information. EPA/240/B-01/003. Available at <http://www.epa.gov/quality/qs-docs/r5-final.pdf>.
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- EPA (US Environmental Protection Agency). 2004. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (OSWER 9240.1-45). Washington DC: EPA, Office of Superfund Remediation and Technology Innovation. EPA 540-R-04-004. Available at <http://www.epa.gov/superfund/programs/clp/download/inorgfg10-08-04.pdf>.
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- EPA (US Environmental Protection Agency). 2006c. *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA QA/G-4). Washington, DC: EPA, Office of Environmental Information. EPA/240/B-06/001. Available at <http://www.epa.gov/quality/qs-docs/g4-final.pdf>.
- EPA (US Environmental Protection Agency). 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (OSWER 9240.1-48). Washington DC: EPA, Office of Superfund Remediation and Technology Innovation. EPA 540-R-08-01. Available at <http://www.epa.gov/superfund/programs/clp/download/somnfg.pdf>.

EPA (US Environmental Protection Agency). 2009. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (OSWER No. 9200.1-85). Washington, DC: EPA, Office of Solid Waste and Emergency Response. EPA 540-R-08-005. Available at <http://www.epa.gov/superfund/policy/pdfs/EPA-540-R-08-005.pdf>.

IDWR (Idaho Department of Water Resources). January 2005. Nitrate Overview for the Statewide Ambient Ground Water Quality Monitoring Program, 1990-2003. Boise, Idaho: IDWR.

Lewis Soil Conservation District. June 2012. LSCD Final Report - Laboratory Nitrate Sampling, Analyses, and Monitoring. Nezperce, Idaho

Lower Yakima Valley Ground Water Advisory Committee. March 2014. Deep Soil Sampling Plan - Lower Yakima Valley Ground Water Management Area. Zillah, Washington.

Shoshone-Bannock Tribe. October 2014. Shoshone-Bannock Fort Hall Post-Harvest Nitrate Deep Soil Sampling Project. Fort Hall, Idaho.

## **Appendix A. Field Data Collection Forms**

Included in this appendix:

- Grower/producer Release Form
- Deep Soil Sampling Program Questionnaire
- Soil Sampling Field Form – Soil Boring Log and Soil Sample Field Log for Deep Soil Sampling Project: Marsh Creek, Minidoka and Twin Falls NPAs
- Sample Chain Of Custody Form
- Western Laboratories Agricultural Soil Submission Form

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RELEASE FORM: Deep Soil Sampling

The ISWCC has developed a procedure designed to separate your identifying information and the location of the fields being sampled from the samples and the results of the analysis. The results of the sample analysis will only be identified by the unique identifying number (UIN) that ISWCC will give only to you. ISWCC will make its best effort to ensure that identifying information is not associated with the UIN. However, ISWCC cannot guarantee the confidentiality of information collected. By signing below, you acknowledge that ISWCC has not in any way represented or guaranteed that your participation in, or any information collected through my participation in, the Post Harvest Deep Soil Sampling Project will be kept or remain confidential.

The contractor hired to conduct the soil sampling of your field(s) will work with you to identify appropriate sampling sites. As part of this process, you are responsible for providing Contractor with an accurate location of underground private utilities on the property. By signing below, you also agree to release ISWCC and Contractor from liability for any damages, losses, or expenses arising from your failure to correctly identify the location of any underground private utilities, including but not limited to irrigation mainline, electrical lines, or any other structures.

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

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## Deep Soil Sampling Program Questionnaire

### General:

As you may know, the aquifers in the Marsh Creek, Minidoka, and Twin Falls Nitrate Priority Areas have been shown to have ground water nitrate concerns. Nitrogen that has migrated below the root zone is useless to crops and can be damaging to water quality and drinking water supplies. The Idaho Soil and Water Conservation Commission (ISWCC) designed this grower survey to help everyone better understand current production methods and provide guidance to assist in improved farming practices. The correlation of the questionnaire with the Deep Soil Sampling Program is an attempt to understand the relationships between the amount and form of nitrogen applied, the application method and timing, the irrigation method, the amount of nitrogen required for plant growth based on cropping patterns, and the quantity of nitrogen that has migrated below the root zone. Participation will be anonymously structured as explained below.

ISWCC is encouraging broad producer participation in the Deep Soil Sampling Program – at no cost to the grower. Nitrogen is an expensive input and once it migrates below the root zone it becomes an expensive loss. The results of your soil samples can help guide your input decisions and potentially reduce your nutrient expenses. A grower survey has been designed to better understand current production methods and assist in improved farming practices, where they may be needed to reduce nitrates in groundwater. For those producers who, for whatever reason chose not to participate in the Deep Soil Sampling Program, ISWCC would still encourage participation through completion of the landowner survey to help us understand current production practices. This questionnaire is intended for either growers who participate in the soil sampling project and those growers who choose not to participate.

We are thanking you in advance for participating in the Marsh Creek /Minidoka/Twin Falls Deep Soil Sampling Program and for completing the questionnaire. As mentioned above, samples will be taken on your property and analyzed at no cost to you, if you participate in the soil sampling program. We are also interested in knowing your agricultural practices such as crops grown, plant nutrients applied, irrigation practices, and soil type. While information gathered in the study will be summarized in the resulting report and used in a collective manner to help describe farming operations, the report will not include specific data tied to an identifiable parcel or location.

We have developed a procedure designed to separate your identity and the location of the soil sample locations from the soil sample results and your participation on the questionnaire. You are welcome to share that information with others, but are under no obligation to do so.

If you agree to participate in the Deep Soil Sampling Program, you will be provided a Unique Identification Number (UIN) that will allow you to retrieve your soil results from the analyzing laboratory. Please keep record of your number as we will not be able retrieve your number after sampling. You can select as many qualified fields to include in the study as you feel

comfortable with and as funding allows. If you decide not to include all fields in the study, be sure to convey that information to the person collecting the samples when they arrive.

Please complete this questionnaire and return it in the envelope addressed to Carolyn Firth, ID Soil and Water Conservation Commission, 1361 East 16<sup>th</sup> St., Burley, ID 83318. Do not include your name with the return address. When the soil samples are collected, the sampler will label the sample containers with the UIN assigned to you.

When all of the samples have been collected, analyzed, and tabulated they will be posted on a website or published in a format suitable for public access. The results from your farm will be identified only by the UIN.

Participation in the Deep Soil Sampling Program can benefit you economically, as the analytical results will help determine whether or not expensive nitrogen is being applied in excess of what your crop can utilize.

Thank you for your participation.

Carolyn Firth,  
ID Soil and Water Conservation Commission,  
1361 East 16<sup>th</sup> St., Burley, ID 83318  
Office: 208 678-1225 Ext 110  
Cell: 208 810-0759

UIN:

Deep Soil Sampling Program  
Questionnaire

**WORKSHEET FOR IRRIGATED CROPLAND**

Unique Identification Number (UIN) \_\_\_\_\_ Date: \_\_\_\_\_

**Field History**

Years Owned/Leased \_\_\_\_\_ Soil Type (if known) \_\_\_\_\_

Currently Soil Testing  Yes  No If yes, how often? \_\_\_\_\_

Acres Farmed: \_\_\_\_\_

Tillage Practices for Crop Cycle

Current Crop (2017) \_\_\_\_\_

**Cropping History (Include Double Crossing)**

Crop Rotation:

2016 Crop 1 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_; Crop 2 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_

2015 Crop 1 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_; Crop 2 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_

2014 Crop 1 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_; Crop 2 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_

2013 Crop 1 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_; Crop 2 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_

**Current method of scheduling irrigation:**

\_\_\_\_\_ ET; \_\_\_\_\_ soil moisture sensors; \_\_\_\_\_ Routine \_\_\_\_\_ hr. sets; Weather Stations \_\_\_\_\_

**Current Irrigation System:**                      **Years of use on crop?** \_\_\_\_\_

Flood Irrigation

Rill Irrigation

Solid Set above canopy -  Impact Sprinklers  Micro spray  Rotators

Solid Set below canopy -  Impact Sprinklers  Micro spray  Rotators

Wheel lines  Impact Sprinklers  Rotators

Hand lines  Impact Sprinklers  Rotators

Linear move  Impact Sprinklers  Micro spray  Rotators

Drip  tube  tape  bury line  above ground line

Pivot  Impact Sprinklers  Micro spray  Rotators

Deep Soil Sampling Program

Questionnaire

\_\_\_ Pod line \_\_\_ Impact Sprinklers \_\_\_ Rotators

\_\_\_ Other: \_\_\_\_\_

**Previous Irrigation System:**                      **Years of use on crop?** \_\_\_\_\_

\_\_\_ Flood Irrigation

\_\_\_ Rill Irrigation

\_\_\_ Solid Set above canopy - \_\_\_ Impact Sprinklers, \_\_\_ Micro spray \_\_\_ Rotators

\_\_\_ Solid Set below canopy - \_\_\_ Impact Sprinklers, \_\_\_ Micro spray \_\_\_ Rotators

\_\_\_ Wheel lines \_\_\_ Impact Sprinklers \_\_\_ Rotators

\_\_\_ Hand lines \_\_\_ Impact Sprinklers \_\_\_ Rotators

\_\_\_ Linear move \_\_\_ Impact Sprinklers, \_\_\_ Micro spray \_\_\_ Rotators

\_\_\_ Drip \_\_\_ tube, \_\_\_ tape, \_\_\_ bury line \_\_\_ above ground line

\_\_\_ Pivot \_\_\_ Impact Sprinklers, \_\_\_ Micro spray \_\_\_ Rotators

\_\_\_ Pod line \_\_\_ Impact Sprinklers \_\_\_ Rotators

\_\_\_ Other: \_\_\_\_\_

**Nitrogen applications**

**Manure - Liquid**

Year	Gallons/Acre applied	#N/1000 gal	How applied	Hours to incorporation	notes
2016					
2015					
2014					
2013					

**Manure - Solid**

Year	Tons/Acre applied	#N/ton	How applied	Hours to incorporation	notes
2016					
2015					
2014					
2013					

**Commercial Fertilizer**

Year	Material type?	#N/Acre applied	How applied	Hours to incorporation	notes
2016					
2015					

Deep Soil Sampling Program  
 Questionnaire

2014					
2013					

Biosolids

Year	Tons/Acre applied	#N/ton	How applied	Hours to incorporation	notes
2016					
2015					
2014					
2013					

Compost

Year	Tons/Acre applied	#N/ton	How applied	Hours to incorporation	notes
2016					
2015					
2014					
2013					

Other

Year	Tons applied	#/ton	How applied	Hours to incorporation	notes
2016					
2015					
2014					
2013					

Please provide additional information if appropriate such as split applications, starter, side dress, etc.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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Soil Boring Log and Soil Sample Field Form for Deep Soil Sampling Project: Marsh Creek, Minidoka, and Twin Falls Nitrate Priority Areas

Return this form, filled out, to Idaho Soil & Water Conservation Commission, 1361 E. 16th St. Burley, ID 83318. Or form may be emailed to Carolyn.Firth@swc.idaho.gov

Unique Identification Number (UIN): \_\_\_\_\_

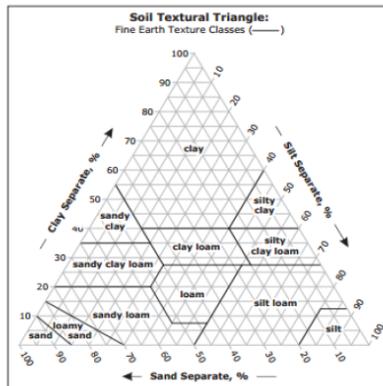
Boring Date: \_\_\_\_\_ Boring Logged by: \_\_\_\_\_

Boring and Sampling Device (example: AMS 9100 Ag Probe with 2-inch tube sampler) \_\_\_\_\_

NRCS Soil Series (soil type) \_\_\_\_\_

Describe each composite soil sample.

Depth in ft	Munsell color	Consistence	Moisture	Texture	Other
0-1					
1-2					
2-3					
3-4					
4-5					
5-6					
6-7					
7-8					



**TEXTURE MODIFIERS** - Conventions for using "Rock Fragment Texture Modifiers" and for using textural adjectives that convey the "% volume" ranges for **Rock Fragments - Size and Quantity**.

Fragment Content % by Volume	Rock Fragment Modifier Usage
< 15	No texture adjective is used (noun only; e.g., loam).
15 to < 35	Use adjective for appropriate size; e.g., gravelly.
35 to < 60	Use "very" with the appropriate size adjective; e.g., very gravelly.
60 to < 90	Use "extremely" with the appropriate size adjective; e.g., extremely gravelly.

Moisture options: D=dry  
 M=moist  
 Dp=damp  
 W=wet

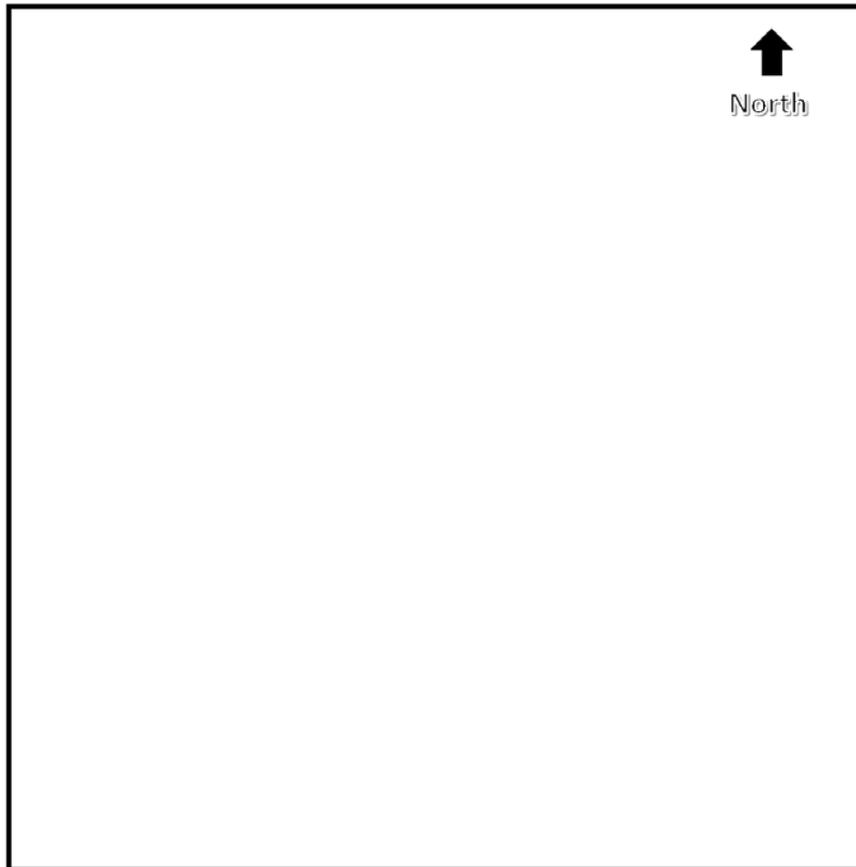
Consistence options:  
 L=loose, S=soft, SH=slightly hard, HA=hard, EH=extremely hard, FR=friable, FI=firm; VFI=very firm; C=cemented.  
 See Field Book for Describing and Sampling Soils, NRCS, August 2011.

Soil Boring Log and Soil Sample Field Form for Deep Soil Sampling Project: Marsh  
Creek, Minidoka, and Twin Falls Nitrate Priority Areas

Unique Identification Number (UIN):

Sampling Site Sketch:

Draw sampling site and borings in relation to irrigation system and other features.



Record any other relevant information here:



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# WESTERN LABORATORIES, INC.

P.O. Box 1020 • 211 Highway 95 (UPS and FedEx) • Parma, Idaho 83660  
 800-656-3858 • Fax 208-722-5550 • john@westernlaboratories.com

## Agricultural Soil Submission Form

Please download this file, use the tab-key to fill out the info and submit this sheet with your samples

Dealer		Crop Advisor				
Email Address						
Grower Name						
Billing Address						
City		State		Zip Code		
Telephone Number			Cell Number			
Field ID	Test #	Acres	Crop 1	Yield Goal 1	Yield Goal 2	Past Crop

*Please write your Field Identification on each sample bag and include this form with your samples. Keep a copy for your records as well.*

Sample collected by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
------------------	------	------	--------------	------------------	------	------	--------------

Chain of custody information

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## **Appendix B. Nitrate Priority Area Maps and County FIPS Codes**

Included in this appendix:

- Figure B1 - Marsh Creek and Minidoka NPA, Cassia and Minidoka Counties
- Figure B2 - Twin Falls NPA and source water delineations, Twin Falls County
- Table B1 – Idaho County FIPS codes

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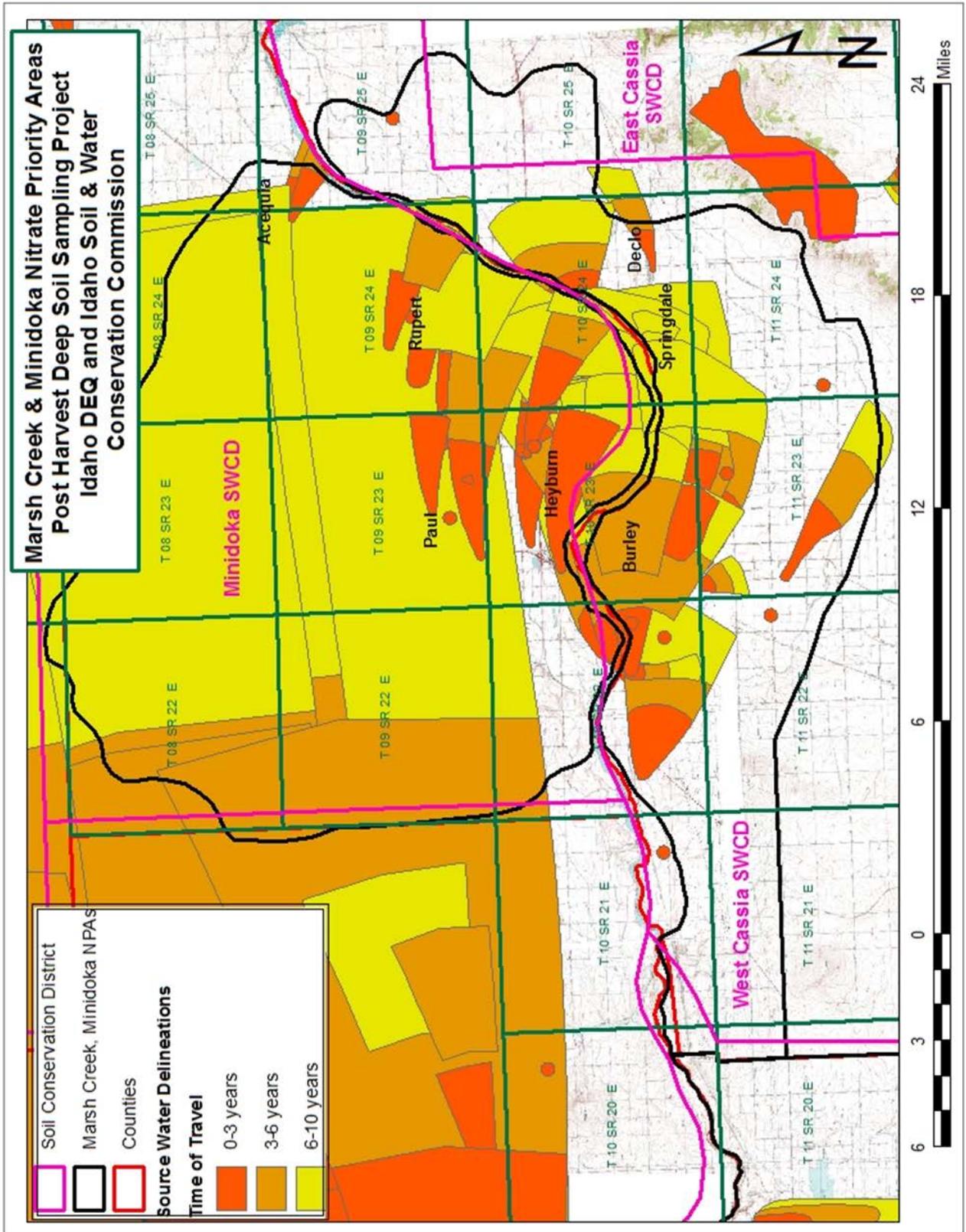


Figure B 1 Marsh Creek and Minidoka NPAs, Cassia and Minidoka Counties.

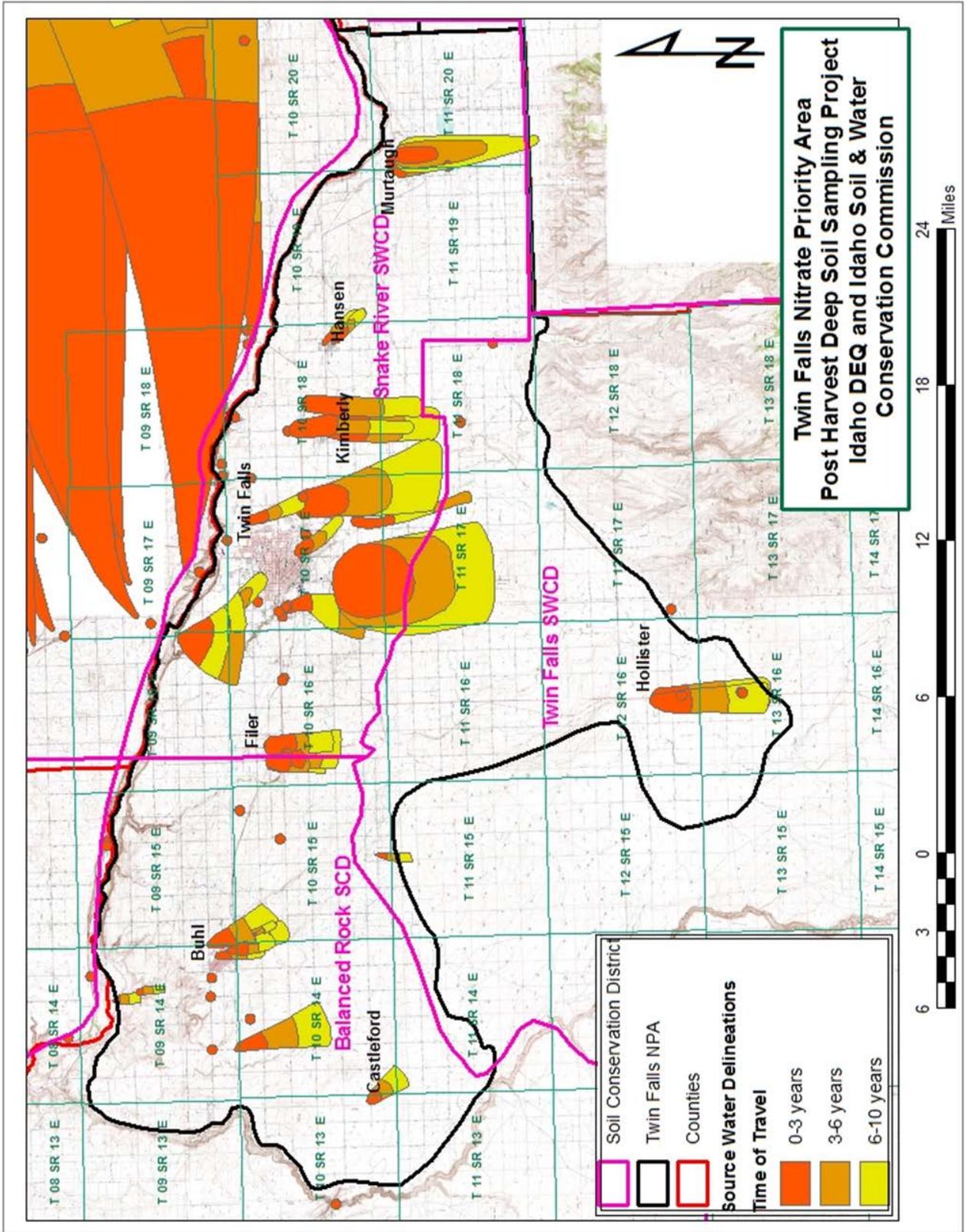


Figure B 2 Twin Falls NPA, Twin Falls County.

Table B1. Idaho County FIPS Codes

County	Count Code	County	Count Code
Ada	1	Gem	45
Adams	3	Gooding	47
Bannock	5	Idaho	49
Bear Lake	7	Jefferson	51
Benewah	9	Jerome	53
Bingham	11	Kootenai	55
Blaine	13	Latah	57
Boise	15	Lemhi	59
Bonner	17	Lewis	61
Bonneville	19	Lincoln	63
Boundary	21	Madison	65
Butte	23	Minidoka	67
Camas	25	Nez Perce	69
Canyon	27	Oneida	71
Caribou	29	Owyhee	73
Cassia	31	Payette	75
Clark	33	Power	77
Clearwater	35	Shoshone	79
Custer	37	Teton	81
Elmore	39	Twin Falls	83
Franklin	41	Valley	85
Fremont	43	Washington	87

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## Appendix C. Project Checklists

All checklists in this appendix are available for download and use by project staff as standalone electronic documents, from either the DEQ TRIM system or the DEQ Quality System website: <http://insidedeq.deq-intra/director/quality.htm>.

Prior to using an activity checklist, project staff should review the applicable requirements listed in the project QAPP and the QMP.

The following checklists are included in this appendix:

- Data Review—TRIM record #2012AEB2
- Data Verification—TRIM record #2012AEB3
- Data Validation—TRIM record #2012AEB4
- Project QAO Annual Audit—TRIM record #2012AEB5

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## DEQ QAPP/FSP Checklist—Data Review

The individual assigned in the project QAPP/FSP to perform project **data review** *shall complete and file this checklist in the appropriate project TRIM system files*. Project personnel are encouraged to expand this standard list, as project conditions warrant.

Printed Name of Staff Performing Data Review	Date Completed
Deep Soil Sampling Project: Marsh Creek, Minidoka, TF NPA	2017AIL31
Project QAPP/FSP Title	QAPP/FSP TRIM Record #

**Check the following review boxes following completion of each listed task.**

**Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Verify that the approved current project QAPP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the QAPP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.

\_\_\_\_\_  
 \_\_\_\_\_

- If the project utilizes an FSP, verify that the approved project FSP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the FSP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.

\_\_\_\_\_  
 \_\_\_\_\_

- Examination and review the project QAPP (and FSP, if used) to determine if additional project-specific data *review* requirements apply. Update this checklist to include all such items.

\_\_\_\_\_  
 \_\_\_\_\_

- Examine project data, identifying errors in data entry, storage, calculation, reduction, transformation, or transcription.

\_\_\_\_\_  
 \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_

Yes No

Ensure all required sample information is documented and available, in preparation for the verification, validation, and assessment process. This includes pertinent project information concerning blanks, matrixes, temperature requirements, duplicates, preservatives, shipping dates, holding times, chain-of-custody records, etc.

\_\_\_\_\_  
 \_\_\_\_\_

Identify if all required nondirect measurement data (existing data) information *and supporting documentation*, as required by the project QAPP (and FSP, if used), have been received and are available for the verification and validation process.

\_\_\_\_\_  
 \_\_\_\_\_

Determine if any data deficiencies exist, such as missing data or compromised data integrity, due to issues such as loss in acquisition, storage, or processing.

\_\_\_\_\_  
 \_\_\_\_\_

Ensure all necessary analytical laboratory support documentation, as set forth and stipulated in the project QAPP (and FSP, if used), have been received from the applicable laboratories.

\_\_\_\_\_  
 \_\_\_\_\_

Identify programming and/or software related errors, if applicable to the project.

\_\_\_\_\_  
 \_\_\_\_\_

Ensure that all deficiencies and/or conditions adverse to quality determined during the project data *review* process have been communicated to project management and are listed on this checklist or attached for inclusion in the TRIM record system.

\_\_\_\_\_  
 \_\_\_\_\_

Verify that a copy of this data review checklist has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional data review actions may be required based on the checklist findings, such as a corrective action plan/reports, etc. The project manager shall consult the DEQ QMP and proceed accordingly.

\_\_\_\_\_  
 \_\_\_\_\_

Please list any additional comments below. Attach additional sheets as necessary.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## DEQ QAPP/FSP Checklist—Data Verification

The individual assigned in the project QAPP/FSP to perform project **data verification** *shall complete and file this checklist in the appropriate project TRIM system files*. Project personnel are encouraged to expand this standard list, as project conditions warrant.

Printed Name of Staff Performing Data Verification	Date Completed
Deep Soil Sampling Project: Marsh Creek, Minidoka, TF NPA	2017AIL31
Project QAPP/FSP Title	QAPP/FSP TRIM Record #

**Check the following review boxes following completion of each listed task.**

**Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Examine and review the project QAPP (and FSP, if used) to determine if additional project specific data *verification* requirements apply. Update this checklist to include all such items.

\_\_\_\_\_  
 \_\_\_\_\_

- Verify that all data completeness criteria, as stated in the project QAPP (and FSP, if used), have been satisfied. This shall include items such as the number of samples, number of QC samples such as spikes and duplicates, and chain-of-custody record continuity.

\_\_\_\_\_  
 \_\_\_\_\_

- Verify that the values of individual data points, and/or comparison calculations such as RPD, meet the criteria specified in the QAPP (and FSP, if used).

\_\_\_\_\_  
 \_\_\_\_\_

- Verify that the required analytical methods, as listed in the project QAPP (and FSP, if used) correspond to the analytical methods employed by the laboratory, as recorded in laboratory reports.

\_\_\_\_\_  
 \_\_\_\_\_

- Verify that QAPP (and FSP, if used) requirements relative to laboratory analytical support documentation have been satisfied by the reporting laboratory, including the correct application of data qualifiers.

\_\_\_\_\_  
 \_\_\_\_\_

- Verify that all supporting information and documentation for nondirect measurement data (existing data) meet the requirements of the QAPP (and FSP, if used). If not, identify any limitations or restriction on the use of such data.

Yes No

- Verify that data and sample collection practices adhered to procedural requirements, to include a review of project logs and field notes, as applicable.
 

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- Verify that sample handling activities conform to QAPP (and FSP, if used) requirements. Examples include sample shipment timelines, sample holding times, preservatives, number of samples obtained, duplicate or split sample frequency, and chain-of-custody documentation.
 

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- Verify that data calculation and handling activities conform to QAPP (and FSP, if used) requirements. Examples include correct use of mathematical formulas and numerical methods, correct use of programs and programing, and correct application of database information transfers.
 

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- Verify that any remaining or unique project QAPP (and FSP, if used) or procedural requirements have been met, and if not, determine the extent to which these requirements failed to be achieved.
 

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- Determine and document any limitations on the use of the project data.
 

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- Ensure that all deficiencies and/or conditions adverse to quality determined during the project data *verification* process have been communicated to project management and are listed on this checklist or attached for inclusion in the TRIM record system.
 

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- Verify that a copy of this data verification checklist has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional data verification actions may be required based on the checklist findings, such as a corrective action plan/reports, etc. The project QAO shall consult the DEQ QMP and proceed accordingly.
 

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Please list any additional comments below. Attach additional sheets as necessary.

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## DEQ QAPP/FSP Checklist—Data Validation

The individual assigned in the project QAPP/FSP to perform project **data validation** shall complete and file this checklist in the appropriate project TRIM system files. Project personnel are encouraged to expand this standard list as project conditions warrant.

Printed Name of Staff Performing Data Validation	Date Completed
Deep Soil Sampling Project: Marsh Creek, Minidoka, TF NPA Project QAPP/FSP Title	2017AIL31 QAPP/FSP TRIM Record #

**Check the following review boxes following completion of each listed task.**

**Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Verify that the approved current project QAPP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the QAPP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.

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- If the project utilizes a FSP, verify that the approved project FSP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the FSP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.

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- Examine and review the project QAPP (and FSP, if used) to determine if additional project-specific data *validation* requirements apply. Update this checklist to include all such items.

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- Evaluate and examine all (100%) of obtained field QC sample results, such as duplicates and trip blanks, etc., followed by assignment (if necessary) of appropriate data qualifiers to these data based on project criteria.

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- Review project analytical laboratory reports and data, including the assigned data qualifiers, to evaluate the data quality with respect to the project DQOs. Assign data qualifiers to individual data values as necessary and appropriate.

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Yes No

- Review the outcome of the data verification effort to evaluate the impact on data quality with respect to the DQOs.

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- Determine, when necessary and where possible, the reasons for any failure to meet methodological, procedural, or contractual requirements and evaluate the impact of such failure on the overall data.

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- Compare the project DQOs, as defined in the project QAPP (and FSP, if used), to the data obtained by the project to assess the adequacy of the data (new or existing) in relation to their intended use.

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- Determine the extent to which any nondirect measurement data (existing data), and the accompanying supporting information and documentation, meet the requirements of the data user. Specifically, does the quality of the existing data adequately support the needs of the project and support the intended use of the data for the project?

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- Determine and document any limitations on the use of the project data.

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- Determine the adequacy of the data to proceed on to the data assessment and reconciliation with user requirements phase.

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- Ensure that all deficiencies and/or conditions adverse to quality determined during the project data *validation* process have been communicated to project management and are listed on this checklist or attached for inclusion in the TRIM record system.

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- Verify that a copy of this data validation checklist has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional data validation actions may be required based on the checklist findings, such as a corrective action plan/reports, etc. The project QAO shall consult the DEQ QMP and proceed accordingly.

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Please list any additional comments below. Attach additional sheets as necessary.

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## DEQ QAPP/FSP Checklist—Annual QAO Project Audit

The individual assigned in the project QAPP/FSP as the project quality assurance officer (QAO) shall audit the project on at least an annual basis. The QAO *shall complete this checklist as part of the audit process and file the completed form in the appropriate project TRIM system files.* Project QAOs are encouraged to expand this standard list as project conditions warrant.

\_\_\_\_\_  
Printed Name of Staff Performing the QAO Audit

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Deep Soil Sampling Project: Marsh Creek, Minidoka, TF NPA

\_\_\_\_\_  
2017AIL31

\_\_\_\_\_  
Project QAPP/FSP Title

\_\_\_\_\_  
QAPP/FSP TRIM Record #

**Check the following review boxes following completion of each listed task.**

**Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Verify that the approved current project QAPP (and FSP, if used), including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information for the QAPP (and FSP, if used) has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the QAPP (and FSP, if used) are not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Verify that the approved and current project documents, such as the project QAPP (and FSP, if used), SOPs, etc., are available to project staff and are in use per project requirements.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Determine through review and observation if the project has performed and documented project activities as described and required by the project QAPP (and FSP, if used) such that the needs of the data user are satisfied.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Determine if the project QAPP (and FSP, if used) adequately document and describe the actual project requirements such that the needs of the data user are satisfied. If necessary, in coordination with the project manager, initiate project document revision, review, and approval efforts in accordance with the DEQ QMP.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Determine if the project analytical requirements are adequately met by the selected laboratory, including use of proper analytical methods and sufficient analytical data support documentation.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Yes No

- Determine if project sample handling activities are in compliance with the requirements of the project QAPP (and FSP, if used).

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- Determine if project field activities are in compliance with the requirements of the project QAPP (and FSP, if used).

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- Determine if all nondirect data acquisition associated with the project has been addressed and properly documented in the project QAPP (and FSP, if used).

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- Compare actual project documents available in the DEQ TRIM record system against the document filing requirements contained in the project QAPP (and FSP, if used). Identify existing deficiencies in the project TRIM system files, such as missing field note pages and missing chain-of-custody forms, and provide this information to the project manager for immediate resolution.

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- Ensure that all deficiencies and/or conditions adverse to quality determined during the project QAO audit process are listed on this checklist or attached for inclusion in the TRIM record system.

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- Verify that a copy of this annual QAO audit report has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional audit administrative actions may be required based on audit findings, such as a corrective action plan/reports, etc. The project QAO shall consult the DEQ QMP and proceed accordingly.

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Please list any additional comments below. Attach additional sheets as necessary.

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## **Appendix D. Procedures**

The following Procedures are included in this appendix:

- University of Idaho College of Agriculture Soil Sampling - Bulletin 704

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# Soil Sampling

Bulletin 704  
(revised)

R. L. Mahler and  
T. A. Tindall



*College of  
Agriculture*

 University of Idaho  
Cooperative Extension System

# Soil Sampling



Environmental concerns have brought nutrient management in agriculture under increased scrutiny. A goal of sound nutrient management is to maximize the proportion of applied nutrients that is used by the crop (nutrient use efficiency). Soil sampling is a best management practice (BMP) for fertilizer management that will help improve nutrient use efficiency and protect the environment.

Soil sampling is also one of the most important steps in a sound crop fertilization program. Poor soil sampling procedures account for more than 90 percent of all errors in fertilizer recommendations based on soil tests. Soil test results are only as good as the soil sample. Once you take a good sample, you must also handle it properly for it to remain a good sample.

A good soil testing program can be divided into four operations: (1) taking the sample, (2) analyzing the sample, (3) interpreting the sample analyses, and (4) making the fertilizer recommendations. This publication focuses on the first step, collecting the soil sample.

Once you take a sample, you must send it to a laboratory for analysis. Then the Extension agricultural educator or fertilizer fieldman in your county can interpret the analysis and make specific fertilizer recommendations. Fertilizer guides from the University of Idaho Cooperative Extension System are also available to help you select the correct fertilizer application rate.

*The soil sampling guidelines in this publication meet sampling standards suggested by federal, state, and local nutrient management programs in Idaho.*

## What is a soil test?

A soil test is a chemical evaluation of the nutrient-supplying capability of a soil at the time of sampling. Not all soil-testing methods are alike nor are all fertilizer recommendations based on those soil tests equally reliable.

Reliable fertilizer recommendations are developed through research by calibrating laboratory soil test values and correlating them with crop responses to fertilizer rates. These soil test correlation trials must be conducted for several years on a particular crop growing on a specific soil type. If soil test calibration is incomplete, fertilizer recommendations based on soil-test results still can only be best guesses.

A soil test does not measure the total amount of a specific nutrient in the soil. There is usually little relationship between the total amount of a nutrient in the soil and the amount of a nutrient that plants can obtain.

A soil test also does not measure the amount of plant-available nutrients in the soil because not all the nutrients in the soil are in a form readily usable by plants. Through research, however, a relationship can usually be established between soil test nutrient levels and the total amount of a nutrient in the soil.

## What does a soil test measure?

Present soil-testing methods measure a certain portion of the total nutrient content of the soil. During testing, this portion is removed from the soil by an extracting solution that is mixed with the soil for a given length of time. The solution containing the extracted portion of the nutrient is separated from the soil by filtration, and then the solution is analyzed.

A low soil-test value for a particular nutrient means the crop will be unable to obtain enough of that nutrient from the soil to produce the highest yield under average soil and climatic conditions. A nutrient deficiency should be corrected by adding the nutrient as a fertilizer. The amount of nutrient that needs to be added for a given soil-test value is calculated based on results from the correlation research test plots.

## Sampling timing

Because nutrient concentrations in the soil vary with the season, you should take soil samples as close as possible to planting or to the time of crop need for the nutrient. Ideally, take the soil samples 2 to 4 weeks before planting or fertilizing the crop. It usually requires 1 to 3 weeks to take a soil sample, get the sample to the testing laboratory, and obtain results.

Sampling very wet, very dry, or frozen soils will not affect soil test results

though collecting soil samples under these conditions is difficult. Do not sample snow-covered fields. The snow makes it difficult to recognize and avoid unusual areas in the field, so you may not get a representative sample.

### Sampling frequency

For best soil fertility management, especially for the mobile nutrients, sample each year and fertilize for the potential yield of the intended crop. Having an analysis performed for every nutrient each year is not necessary. Whether you need an analysis of a nutrient depends on such things as its mobility in the soil and the nutrient requirements of the crop.

Take soil samples at least once during each crop rotation cycle. Maintain a

record of soil test results on each field to evaluate long-term trends in nutrient levels.

### Sampling procedure

One of the most important steps in a soil testing program is to collect a soil sample that represents the area to be fertilized. If the soil sample is not representative, the test results and recommendations can be misleading.

The correct steps in soil sampling are illustrated in figure 1. Before sampling, obtain necessary information, materials, and equipment from the Extension agricultural educator or fertilizer fieldman in your county.

Use proper soil sampling tools. A soil auger or probe is most convenient, but

you can use a shovel or spade for shallow samples. You will need a plastic bucket or other container for each sample to help you collect and mix a composite sample.

Be sure that all equipment is clean, and especially be sure it is free of fertilizer. Even a small amount of fertilizer dust can result in a highly erroneous analysis. Do not use a galvanized bucket when analyzing for zinc (Zn) or a rusty shovel or bucket when analyzing for iron (Fe). If the sample will be analyzed for Fe or manganese (Mn), do not dry the soil sample before shipping.

When sampling, avoid unusual areas such as eroded sections, dead furrows, and fence lines. If the field to be sampled covers a large area with

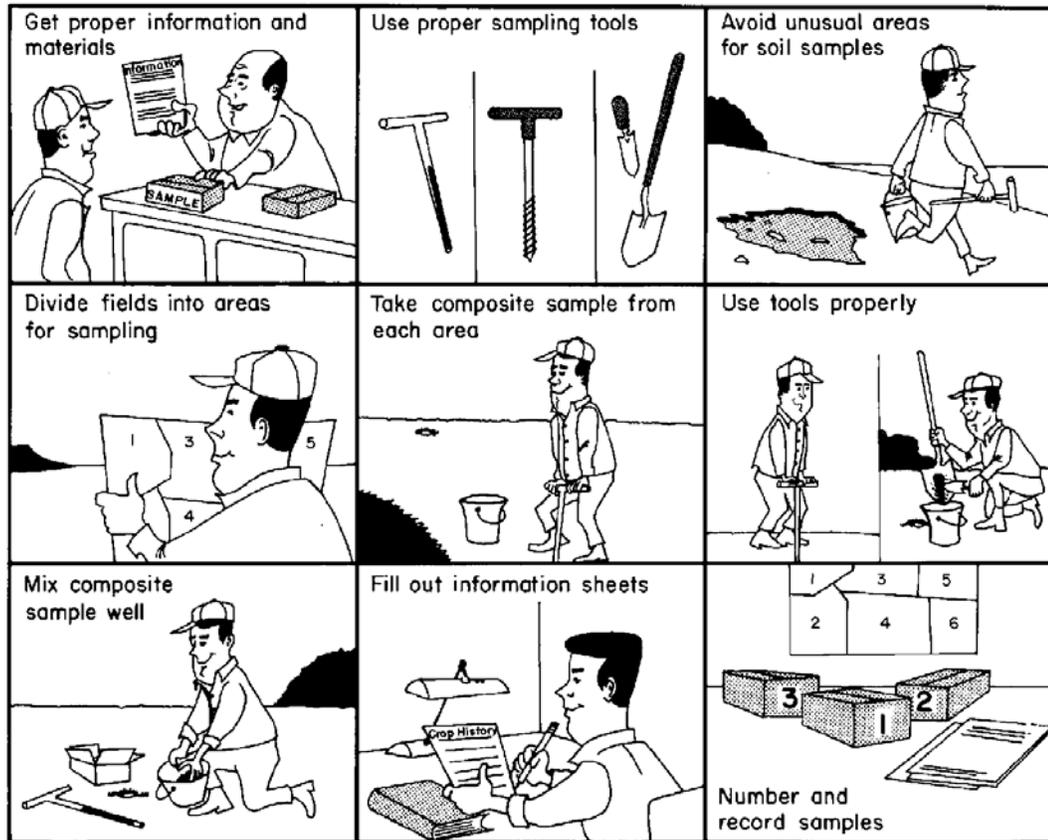


Fig. 1. Follow these steps to obtain a good sample for testing (redrawn courtesy of the National Fertilizer Institute).

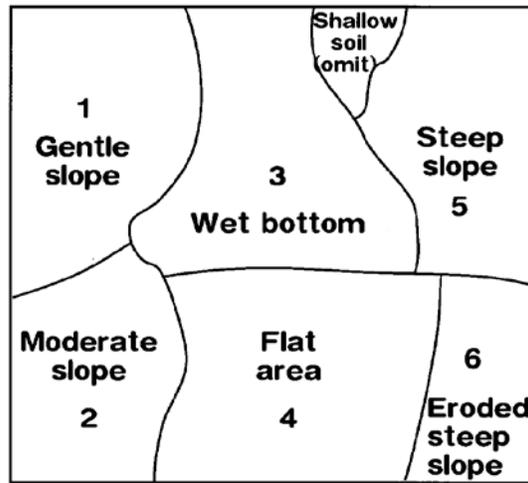


Fig. 2. A field with areas identified as sampling units.

varied topography, subdivide it into relatively uniform sampling units (fig. 2). Sampling subdivision units that are too small to fertilize separately may be of interest, but impractical if you do not treat the small units differently from the rest of the field. Omit these areas from the sampling.

Within each sampling unit take soil samples from several different locations and mix these subsamples into one composite sample. The number of subsamples needed to obtain a representative composite sample depends on the uniformity and size of the sampling unit (table 1). Although the numbers of subsamples in table 1 give the best results, they may be unrealistic if you plan to take a great number of samples. An absolute minimum of 10 subsamples from each sampling unit is necessary to obtain an

Table 1. Number of subsamples recommended for a representative composite sample based on field size.

Field size (acres)	Number of subsamples
fewer than 5	15
5 to 10	18
10 to 25	20
25 to 50	25
more than 50	30

acceptable sample. The more subsamples you take, the better the representation of the area sampled.

Take all subsamples randomly from the sampling unit, but be sure to distribute subsample sites throughout the sampling unit. Meander or zig-zag throughout each sampling unit to sample the area. Special considerations are necessary in eroded areas, furrow irrigation, under no-till, and where fertilizer is banded (see "Special Sampling").

The total amount of soil you collect from the sampling unit may be more

Table 2. Effective rooting depth for some common Idaho crops.

Crop	Depth (feet)
Cereals (wheat, barley, oats)	5 to 6
Corn	5 to 6
Alfalfa, rapeseed	4 to 5
Hops, grapes, tree fruits	4 to 5
Sugarbeets	2 to 3
Peas, beans, lentils, onions, potatoes, mint	2
Vegetable seed	1 to 1½

than you need for analyses. Mix the individual subsamples together thoroughly and take the soil sample from the composite mixture. The composite sample should be at least 1 pint—about 1 pound—in size.

### Sampling depth

Depth of sampling is critical because tillage and nutrient mobility in the soil can greatly influence nutrient levels in different soil zones (fig. 3). Sampling depth depends on the crop, cultural practices, tillage depth, and the nutrients to be analyzed.

Because the greatest abundance of plant roots, greatest biological activity,

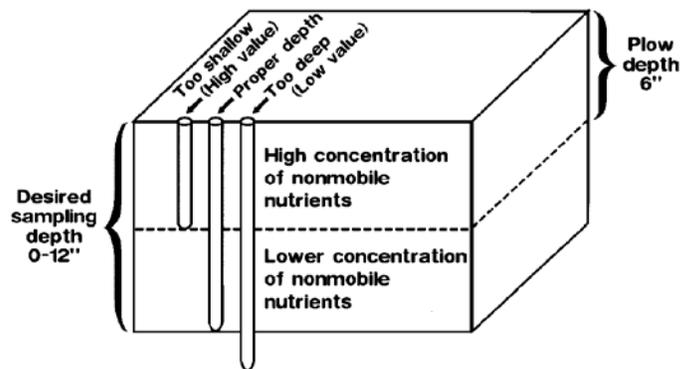


Fig. 3. Too deep or shallow a sampling depth can produce inaccurate soil test results. The plow layer is usually higher in nonmobile nutrients than the soil layers below it.

and highest nutrient levels occur in the surface layers, the upper 12 inches of soil are used for most analyses. The analyses run on the surface sample include soil reaction (pH), phosphorus (P), potassium (K), organic matter, sulfur (S), boron (B), zinc (Zn), and other micronutrients.

Sampling depth is especially critical for nonmobile nutrients such as P and K. The recommended sampling depth for nonmobile nutrients is 12 inches (fig. 3).

The tillage zone, typically 6 to 8 inches deep, usually contains a relatively uniform, high concentration of nonmobile nutrients. Below the tillage zone the concentration is usually lower. Therefore, a sample from the tillage zone will usually have a higher content of nonmobile

nutrients than a sample from the desired 0- to 12-inch sample depth. This can lead to erroneous results.

### Depth sampling

When sampling for mobile nutrients such as nitrogen (N), boron (B), and sulfur (S), take samples by 1-foot increments to the effective rooting depth of the crop (fig. 4). This can be a depth of 5 to 6 feet (table 2) unless the soil has a root-limiting layer such as bedrock or hardpan. For each foot depth, take 10 or more subsamples at random from the sampling unit.

If you plan to sample less than a year after banding or injecting fertilizer or if you have any question about fertilizer placement, use the sampling technique described under "Areas

Where Fertilizer Has Been Banded." Irrigation or precipitation should disperse mobile nutrients over a period of a year.

### Sample handling

Soil samples need special handling to ensure accurate results and minimize changes in nutrient levels because of biological activity. Keep moist soil

samples cool at all times during and after sampling. Samples can be frozen or refrigerated for extended periods of time without adverse effects.

If the samples cannot be refrigerated or frozen soon after collection, air dry them or take them directly to the soil testing laboratory. Air dry by spreading the sample in a thin layer on a plastic sheet. Break up all clods or lumps, and spread the soil in a layer about 1/4 inch deep. Dry at room temperature. If a circulating fan is available, position it to move the air over the sample for rapid drying.

**Caution:** Do not dry where agricultural chemical or fertilizer fumes or dust will come in contact with the samples. Do not use artificial heat in drying. Ask the Extension agricultural educator or fertilizer fieldman in your county for more details concerning special handling of soil samples.

When the soil samples are dry, mix the soil thoroughly, crushing any coarse lumps. Take from the sample about 1 pint (roughly 1 pound) of well-mixed soil and place it in a soil sample bag or other container. Soil sample bags and soil test report forms are available from the Cooperative Extension System office in your county or from a fertilizer fieldman.

Label the bag carefully with your name, the sample number, sample depth, and field number. The field number should correspond with a field or farm map showing the areas

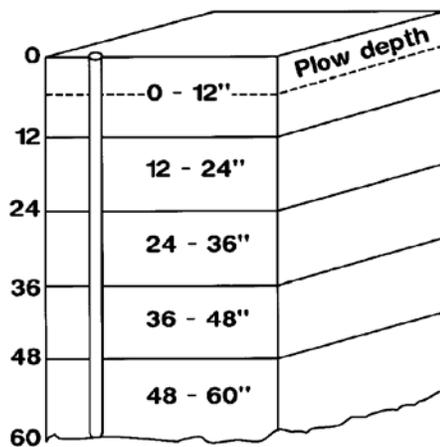


Fig. 4. Depth sampling (successive samples by 12-inch increments) for mobile nutrients (especially N) should be continued to rooting depth, which may be 5 to 6 feet for some crops.

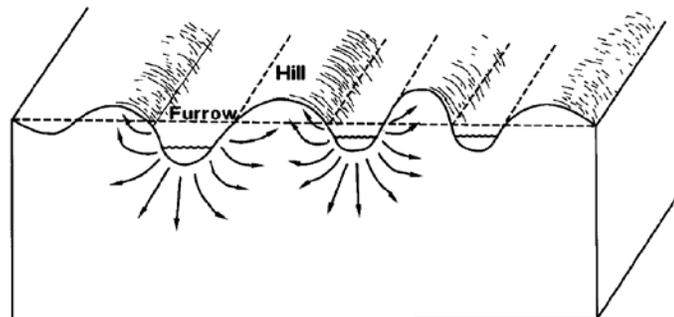


Fig. 5. Movement of mobile nutrients in furrow-irrigated fields.

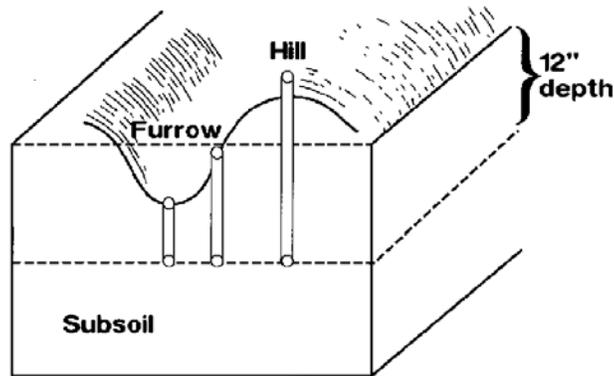


Fig. 6. Special sampling techniques are required when soil sampling furrow-irrigated fields. Take a sample from the hilltop, the furrow bottom, and at the midpoint between the hilltop and furrow bottom. The 12-inch sampling depth is based on the midpoint sampling location.

sampled. This will help you keep an accurate record of soil test reports. Provide information on crop to be grown, yield potential, recent history of crops grown, yields, fertilizer applied, and other information.

### Sample analysis

Analyze regularly only for those nutrients that have been shown to be yield limiting in your area or for the crop to be grown. In general, all soils should be analyzed for N, P, K, and S. For determination of potential need for micronutrients, refer to PNW 276, *Current Nutrient Status of Soils in Idaho, Oregon, and Washington*. Occasional analyses for micronutrient concentrations may be advisable.

### Special sampling

Special sampling problems occur in fields that have been leveled for irrigation, fields that have lost all or most topsoil as a result of erosion, fields that are surface (furrow)

irrigated, fields that have had a fertilizer band applied, and fields that are not thoroughly tilled.

### Land-leveled and eroded areas

Areas that have been eroded or artificially leveled for irrigation usually have little or no original topsoil. The soil surface may be exposed subsoil material. These areas should be sampled separately if they are large enough to be managed differently from where topsoil has not been removed. Subsoil material is usually low in organic matter and can be high in clay, calcium carbonate (lime), or both.

### Furrow-irrigated fields

For a representative soil sample, sample furrow-irrigated fields before the furrowing operation. If furrowing has already been completed, follow the special sampling procedures described here.

The movement of water and dissolved plant nutrients can create unique nutrient distribution patterns in the hills between the furrows (fig. 5). To obtain a representative sample, you need to be aware of furrow direction, spacing, and location, and to take closely spaced soil samples perpendicular to the furrow (fig. 6).

Approximately 20 sites (with at least three samples per site) are needed for a representative composite soil sample. At each sampling site, take a sample from the hilltop, from the midpoint between the hilltop and furrow, and from the furrow bottom. The sampling depth at the midpoint between the hilltop and furrow bottom should be 12 inches. The bottom point of this sample should be the same as for the furrow and hilltop samples. Thus, the furrow sampling depth will be less than 12 inches, while the hilltop sampling depth will be more than 12 inches (fig. 6).

Mix the hilltop, midpoint, and furrow samples to make a composite sample for each site. Mix the site samples for a representative composite field soil

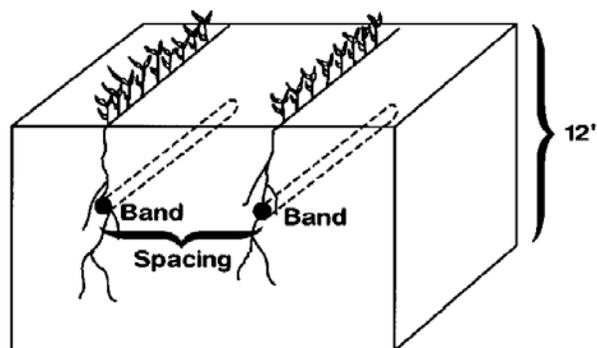


Fig. 7. Diagram of fertilizer location in soil where fertilizer has been banded.

sample to be analyzed for nonmobile nutrients (P, K, and micronutrients). Deeper profile sampling (depth sampling) is recommended for mobile nutrients (N and S).

### *Areas where fertilizer has been banded*

Banding of fertilizers is becoming a more common practice (fig. 7). In fields where fertilizers have been banded and tillage has occurred before soil sampling, regular sampling procedures can be followed. However, if tillage has not adequately mixed the soil, special soil sampling is required. If a field has had a banded fertilizer application the previous growing season and has not been plowed, an ideal sample would be a continuous slice 1 to 2 inches thick and 12 inches deep extending from the center of one band to the center of the next band.

Little research has been conducted to determine the best method of sampling banded fields. Currently three different approaches are used widely. Each method produces a satisfactory representative sample, but the effort required to obtain these samples differs considerably.

**Systematic sampling method** . If you know the direction, depth, and spacing of the fertilizer band, you can obtain a representative soil sample with this sampling procedure. Take 5 to 10 soil samples perpendicular to the band row beginning in the edge of a fertilizer band and ending at the edge of an adjacent band (fig. 8). Follow this procedure on at least 20 sampling sites in each field or portion of a field being sampled. Mix and composite the soils collected from each site to obtain a representative soil sample.

**Controlled sampling method.** You also should know the direction, depth, and spacing of the fertilizer bands to obtain a representative soil sample with this method. Take 20 to 30 soil cores from locations scattered throughout the field or portion of the field. Avoid sampling directly in a fertilizer band.

The composite sample should adequately represent the area being sampled. This method may result in slightly lower soil test values of nonmobile nutrients (P, K, and micronutrients) than the systematic and random sampling methods.

**Random sampling method** . Use this sampling method when the location of the previous season's fertilizer bands is not known. Take 40 to 60 random soil cores to form a composite sample of the area being sampled.

### *Reduced tillage or no-till fields*

You may need special approaches to soil sampling with reduced tillage or no-till fields because the soil has been disturbed so little that fertilizer, whether broadcast on the surface or banded below the surface, is not mixed into the soil. You need to know the history of fertilization, tillage, and other management practices to determine how to obtain a representative sample.

If nonmobile nutrients (P, K, and micronutrients other than B) have been surface broadcast and little or no tillage has been used since their application, remove the surface 1 inch of soil before sampling. Nutrients in the top inch of soil will probably not be available to the growing crop.

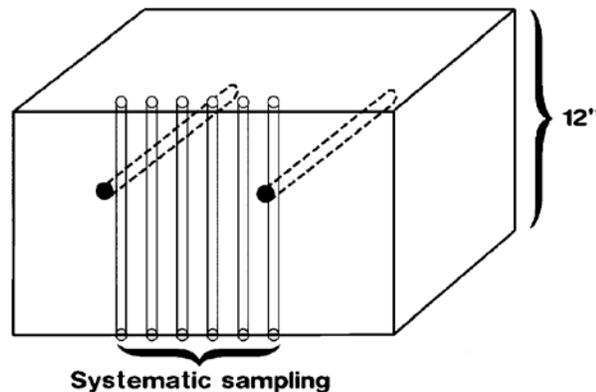


Fig. 8. Systematic soil sampling in a field where fertilizer has been banded (sampling method 1).

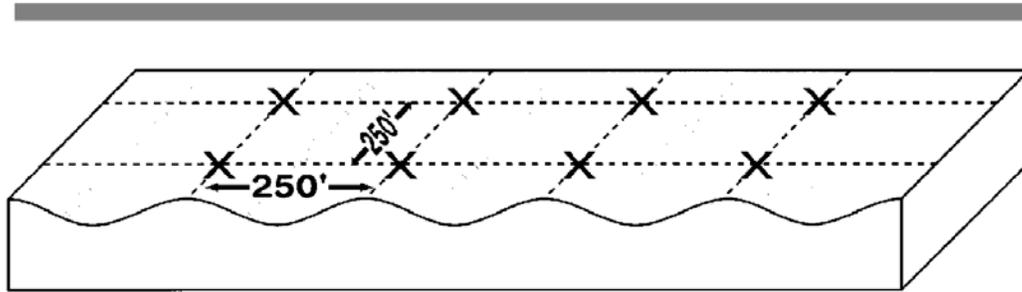


Fig. 9. Grid soil sampling pattern where samples are collected every 250 feet. Note that a complete soil sample is collected at each spot marked with an X.

If fertilizer has been banded with the no-till system, consider methods suggested in "Areas Where Fertilizer Has Been Banded." If a field has been under a continuous no-till system for a long time, determine the pH of the surface foot at 3-inch intervals (0 to 3, 3 to 6, 6 to 9, 9 to 12 inches) every 3 to 5 years. Soil pH will affect the availability of fertilizer nutrients as well as the activity of commonly used herbicides, insecticides, and fungicides.

### *Grid sampling in nonuniform fields*

Many fields are not uniform and vary both horizontally and vertically across landscapes. Traditional soil sampling procedures average nutrient levels in soil subsamples to determine average nutrient levels in the field. The nutrient values obtained are good, but the manager must realize that many of the values in the field are either less than or greater than the values determined. When fields are broken into grids with shorter distances between the sampling points a more precise soil map can be developed to determine nutrient needs.

The technology is now available to combine grid sampling with variable

rate fertilizer application to handle spatial variability within a field. These application techniques make fertilizer nutrient application more precise, resulting in greater nutrient use efficiency and reducing pollution potential.

Irrigated fields including individual pivots should be set up in a 200- to 300-foot grid for potato, sugarbeets, corn, and other potentially high-N-use crops (fig. 9). A wider grid of 400 feet may be used for small grains, beans, and other crops where N management is less intensive or under dryland conditions.

Soil nutrient needs for each segment of the grid are entered into a computer-driven system mounted on specialized commercial fertilizer application equipment. Variable rates of nutrients are then applied based on individual soil samples over the entire field.

A similar system designed for fertilizer applications through pivot sprinklers is being developed by the University of Idaho. This system has the potential to apply variable rates of nutrients and water specifically related to changes across individual fields.

The Soil Conservation Service has a digitized soil survey information system (SSIS), which when combined with the results of grid sampling provides specific information and recommendations for soils and soil types within a field. The SSIS can locate pockets of sandy or coarse-textured soils where leaching is a major concern or areas of finer-textured soils where pockets of residual N may occur. The SSIS also indicates where erosion or surface runoff may be high and where areas should be targeted for federal programs such as the Conservation Reserve Program.

Another computer-mapping technique, Geographic Information Systems (GIS), can be combined with the results of grid sampling to provide growers and land managers with information for land-use planning.

Additional information on proper soil sampling procedures can be obtained from the Extension agricultural educator or fertilizer fieldman in your county.

The authors—Robert L. Mahler, soil scientist, Moscow, and Terry A. Tindall, former Extension soil scientist, Twin Falls Research and Extension Center; both with the University of Idaho Department of Plant, Soil, and Entomological Sciences.

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, LeRoy D. Luft, Director of Cooperative Extension System, University of Idaho, Moscow, Idaho 83844. The University of Idaho provides equal opportunity in education and employment on the basis of race, color, religion, national origin, age, gender, disability, or status as a Vietnam-era veteran, as required by state and federal laws.

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\$2.00

## **Service Agreement Post-Harvest Deep Soil Sampling Project**

THIS SERVICE AGREEMENT (“Agreement”) is made and entered into as of the \_\_\_ day of March, 2017, by and between the Idaho Soil and Water Conservation Commission, an agency of the State of Idaho (“ISWCC”) and Western Laboratories, Inc., an Idaho Corporation (the “Contractor”), for the services described in this Agreement. In consideration of the mutual promises contained herein, the parties agree as follows:

### 1. RECITALS

1.1 ISWCC has entered into an agreement with the Idaho Department of Environmental Quality (IDEQ) to conduct the Post-Harvest Deep Soil Sampling Project.

1.2 Pursuant to IDAPA 38.05.01.044.01, ISWCC, through the Division of Purchasing, requested quotes from contractors to analyze soil samples to be collected in Marsh Creek, Minidoka, and Twin Falls Nitrate Priority Areas.

1.3 ISWCC received no quotes in response.

1.4 Under IDAPA 38.05.01.084.02(b), the Administrator of the Department of Purchasing may authorize negotiations when a competitive solicitation has been unsuccessful due to inadequate competition.

1.5 On October 18, 2016, ISWCC received authority from the Administrator to negotiate with the Contractor for analysis services. Contractor is willing to provide the requested analysis services under the terms and conditions set forth in this Agreement.

### 2. AGREEMENT

2.1 The following documents attached hereto are incorporated into this Agreement by reference: Exhibit A (Scope of Work–Sample Analysis); Exhibit B (Cost and Billing Procedures); and Exhibit C (Quality Assurance Project Plan (“QAPP”).

2.2 This Agreement, including the above incorporated documents, sets forth the entire agreement between the parties related to the subject matter of this Agreement and may not be modified without the written consent of both parties.

2.3 Notwithstanding Section 2.2, ISWCC and IDEQ may from time to time amend the QAPP included herein as Exhibit C. The parties agree that such amendments to the QAPP shall be incorporated into this agreement upon Contractor receiving notice of amendments. Amendments shall supersede any conflicting terms in Exhibit A.

### 3. TERM OF AGREEMENT

This Agreement shall expire on December 31, 2017, unless the parties agree to an extension in writing, or unless the Agreement is earlier terminated as provided herein

#### 4. SCOPE OF WORK

4.1 The Contractor shall perform the sample analysis services set forth in Exhibit A and Exhibit C in accordance with the procedures set forth therein. The Contractor is responsible for ensuring that all of its officers, employees, agents, and subcontractors follow the procedures set forth in Exhibit A and Exhibit C while performing services under this Agreement.

4.2 The Contractor represents and warrants that it has the necessary and requisite skill to perform the work required under this Agreement and that its officers, employees, agents or subcontractors assigned by the Contractor to perform any such work will be qualified to perform the assigned duties.

4.3 The Contractor represents and warrants that it participates in the North American Laboratory Proficiency Testing Program (NAPT) and NAPT's Proficiency Assessment Program (PAP) for the methods listed in Exhibit A.

4.4 The Contractor represents and warrants that it has completed, obtained and performed all registrations, filings, approvals, authorizations, certifications or examinations required by any government or governmental authority for all acts contemplated by this Agreement and has complied or will comply, with all existing, new or amended laws that apply to its performance under the Agreement.

#### 5. PAYMENT

5.1 ISWCC shall pay the costs and the Contractor shall bill ISWCC as set forth in Exhibit B.

5.2 ISWCC shall not be liable to the Contractor for any costs or expenses paid or incurred by the Contractor unless specifically set forth in this Agreement.

#### 6. OWNERSHIP

All information furnished to the Contractor for its use pursuant to this Agreement shall belong to ISWCC and shall be returned to ISWCC in good order upon completion of the Agreement or upon ISWCC's request. All documents, reports, and any other data developed by the Contractor for ISWCC in the performance of this Agreement shall become the property of ISWCC. ISWCC shall retain exclusive rights of ownership to all work produced by the Contractor under this Agreement.

#### 7. CONTRACT RELATIONSHIP

The Contractor's status under this Agreement shall be that of an independent contractor, and not that of an agent or employee. The Contractor is solely liable for all labor, taxes, insurance, required bonding and other expenses, except as specifically stated herein. The Contractor shall exonerate, indemnify and hold the State harmless from and against and assume full responsibility for payment of all federal, state and local taxes or contributions imposed or required under unemployment insurance, social security, workman's

compensation and income tax laws with respect to the Contractor or Contractor's employees engaged in performance under this Agreement.

8. COMPLIANCE WITH THE LAW

The Contractor shall comply will all requirements of federal and state statutes, rules, and regulations applicable to Contractor or to the Services performed by Contractor pursuant to this Agreement.

9. CONFIDENTIALITY

Pursuant to this Agreement, Contractor may collect, or the ISWCC may disclose to Contractor, financial, personnel or other information that the ISWCC regards as proprietary or confidential ("Confidential Information"). Confidential Information shall belong solely to the ISWCC. Contractor shall use such Confidential Information only in the performance of its services under this Agreement and shall not disclose Confidential Information to any third party, except with the ISWCC's prior written consent or under a valid order of a court or governmental agency of competent jurisdiction and then, only upon timely notice to the ISWCC. The ISWCC may require that Contractor's officers, employees, agents or subcontractors agree in writing to the obligations contained in this section. The ISWCC may require that Confidential Information be returned to the ISWCC upon termination of this Agreement. The confidentiality obligations contained in this section shall survive termination of this Agreement.

10. INDEMNIFICATION

The Contractor shall indemnify, defend and save harmless the State, its officers, agents and employees from and against any and all liability, claims, damages, losses, expenses, actions, attorney fees and suits whatsoever caused by or arising out of Contractor's negligent or wrongful performance, act or omissions under this Agreement or Contractor's failure to comply with any state or federal statute, law, regulation or rule. Nothing contained herein shall be deemed to constitute a waiver of the State's sovereign immunity, which immunity is hereby expressly reserved.

11. INSURANCE

11.1 The Contractor shall obtain and maintain insurance at its own expense as required herein for the duration of this Agreement, and comply with all limits, terms and conditions stipulated. Policies shall provide, or be endorsed to provide, all required coverage. The Contractor shall provide certificates of insurance or certified endorsements as applicable for the insurance required. The Contractor shall not provide analysis services under this Agreement until satisfactory evidence of all required insurance is provided to ISWCC.

11.2 All insurance, except for Workers Compensation, shall be endorsed to name the State of Idaho and the Idaho Soil and Water Conservation Commission as Additional Insureds. The Contractor shall provide to ISWCC a certified endorsement naming the State of Idaho and the Idaho Soil and Water Conservation Commission as Additional Insureds.

11.3 All insurance shall be with insurers rated A-, VII, or better in the latest Bests Rating Guide, and be in good standing and authorized to transact business in Idaho. The coverage provided by such policies shall be primary. Policies may contain deductibles, but such deductibles shall not be deducted from any damages due to the State or ISWCC.

11.4 If any of the liability insurance required for this agreement is arranged on a “claims-made” basis, “tail coverage” will be required at the completion or termination of this agreement for a duration of twenty-four (24) months thereafter. Continuous “claims-made” coverage will be acceptable in lieu of “tail-coverage” provided the retroactive date is on or before the effective date of this agreement, or twenty-four-months “prior acts” coverage is provided. The Contractor will be responsible for furnishing certification of “tail coverage” or continuous “claims-made” coverage.

11.5 By requiring insurance herein, ISWCC does not represent that coverage and limits will necessarily be adequate to protect the Contractor, and such coverage and limits shall not be deemed as a limitation on the Contractor’s liability under the indemnities granted to the state.

11.6 Contractor shall maintain insurance in amounts not less than the following:

11.6.1 Commercial General Liability (CGL) with a limit of not less than \$1,000,000 each occurrence, and \$1,000,000 annual aggregate, if defense is outside the limits. If defense is inside the limits, the limit must be \$2,000,000 each occurrence, and \$2,000,000 aggregate. If necessary, a commercial umbrella or excess policy may be used to meet the limits required, providing the CGL is listed on the underlying insurance in the umbrella or excess policy, and the umbrella/excess policy meets the requirements above for acceptable carriers.

11.6.2 Automobile Liability including owned, non-owned, and hired liability with a limit of not less than \$1,000,000 each occurrence, and \$1,000,000 aggregate. If necessary, a commercial umbrella or excess policy may be used to meet the limits required, providing the Auto is listed on the underlying insurance in the umbrella or excess policy, and the umbrella/excess policy meets the requirements above for acceptable carriers.

11.6.3 Workers Compensation Insurance in amounts as required by statute in all states in which the contractor performs work, and Employers’ Liability with a limit of \$100,000 Bodily Injury by Accident-each Accident, \$100,000 Bodily Injury by disease-each employee, \$500,000 Bodily Injury by Disease-policy limit.

## 12. ASSIGNMENTS, SUBCONTRACTS, MERGER AND CONSOLIDATION

12.1 The Contractor shall not assign all or a portion of this Agreement without ISWCC’s prior written permission. The Contractor shall not enter into any subcontract relating to the performance of this Agreement or any part thereof without ISWCC’s prior written permission. Approval by ISWCC of the Contractor’s request to subcontract or acceptance of or payment for subcontracted work by ISWCC shall not in any way relieve

the Contractor of any responsibility under this Agreement. The Contractor shall be and remain liable for all damages to ISWCC based on negligent performance or non-performance of work under the Agreement by Contractor's subcontractor or its sub-subcontractor.

12.2 Any entity into which Contractor may be merged or with which it may be consolidated, any entity resulting from any merger or consolidation to which Contractor is a party, or any entity succeeding to the business of Contractor shall not become the successor of Contractor without first obtaining the prior written approval of the ISWCC.

### 13. TERMINATION

13.1 Either party may terminate this Agreement immediately upon written notice if at any time: (a) the other party is in material breach of a warranty, term, condition, covenant or obligation under this Agreement and fails to cure that breach within ten (10) days written notice thereof; or (b) Contractor is in breach of Section 9 on Confidentially.

13.2 ISWCC may terminate this Agreement for its convenience in whole or in part, upon thirty (30) days written notice to Contractor, if ISWCC determines it is in its best interest.

13.3 Upon termination of this Agreement, Contractor shall (a) promptly discontinue all work, unless the termination notice directs otherwise; and, (b) promptly deliver or make available to ISWCC all data, reports, forms, and other information and materials gathered by Contractor in performing services under this Agreement.

### 14. NOTICES

Any notice given in connection with the Agreement shall be given in writing and shall be delivered either by hand to the other party or by certified mail, return receipt requested, to the other party at the other party's address stated below. Either party may change its address by giving notice of the change in accordance with this paragraph.

Contractor: Western Laboratories, Inc.  
211 Hwy 95  
Parma, ID 83660  
Attention: Cathy Bingham

ISWCC: Idaho Soil and Water Conservation Commission  
1361 E. 16th St.  
Burley, ID 83318  
Attention: Carolyn Firth

### 15. FISCAL NECESSITY AND NON-APPROPRIATION

It is understood and agreed that ISWCC is a governmental entity, and the Agreement shall in no way or manner be construed so as to bind or obligate ISWCC or the State of Idaho

beyond the term of any particular appropriation of funds by the State Legislature or United States Congress as may exist from time to time. ISWCC reserves the right to reduce the Agreement automatically or terminate the Agreement if, in its sole judgment, the legislature of the State of Idaho or the United States Congress fails, neglects, or refuses to appropriate sufficient funds as may be required for ISWCC to continue payments or if the Executive Branch mandates any cuts or holdbacks in spending. Any such reduction or termination shall take effect on thirty (30) days prior notice.

#### 16. PUBLIC RECORDS

Pursuant to Idaho Code section 74-101 *et seq.*, information or documents received from the Contractor may be open to public inspection and copying unless exempt from disclosure. The Contractor shall clearly designate individual documents as “exempt” on each page of such documents and shall indicate the basis for such exemption. ISWCC will not accept the marking of an entire document as exempt. In addition, ISWCC will not accept a legend or statement on one (1) page that all, or substantially all, of the document is exempt from disclosure. Contractor shall indemnify and defend the ISWCC against all liability, claims, damages, losses, expenses, actions, attorney fees and suits whatsoever for honoring such a designation or for the Contractor’s failure to designate individual documents as exempt. The Contractor’s failure to designate as exempt any document or portion of a document that is released by the State shall constitute a complete waiver of any and all claims for damages caused by any such release. If the State receives a request for materials claimed exempt by the Contractor, the Contractor shall provide the legal defense for such claim.

#### 17. GOVERNING LAW

This Agreement shall be governed by the laws of the State of Idaho. The venue of any action brought by any party to this Agreement shall be the Fourth District Court in and for the County of Ada.

#### 18. SOVEREIGN IMMUNITY

Nothing contained herein shall be deemed to constitute a waiver of the State’s sovereign immunity, which immunity is hereby expressly reserved.

#### 19. FORCE MAJEURE

Neither party shall be liable for or deemed to be in default for any delay or failure to perform under this Agreement if such delay or failure to perform results from an act of God, civil or military authority, act of war, riot, insurrection or other occurrence beyond that party’s control. In such case, the intervening cause must not be caused by the party asserting it and the excused party is obligated to promptly perform in accordance with the terms of this Agreement after the intervening cause ceases.

#### 20. TAXES

The State of Idaho and ISWCC are generally exempt from payment of Idaho State Sales and Use Tax for property purchased for its use under the authority of Idaho Code, Section 63-3622 as a government instrumentality. In addition, the State of Idaho and ISWCC are generally exempt from payment of Federal Excise Tax under a permanent authority from

the district Director of the Internal Revenue Service. Exemption certificates will be furnished upon written request by the Contractor. If the Contractor is required to pay any taxes incurred as a result of doing business with the State of Idaho, it shall be solely responsible for the payment of those taxes.

21. NO WAIVER

The waiver of any breach or default of this Agreement shall not be construed as or deemed to be a waiver of any subsequent breach or default.

22. SEVERALBILITY

If any part of this contract is declared invalid or becomes inoperative for any reason, such invalidity or failure shall not affect the validity and enforceability of any other provision.

23. SURVIVAL.

Any termination, cancellation, or expiration of this Agreement notwithstanding, provisions which are intended to survive and continue shall survive and continue, including, but not limited to, the provisions of sections 2, 6, 7, 9–11, and 15–22.

24. HEADINGS

The captions and headings contained herein are for convenience and reference and are not intended to define or limit the scope of any provision of this Agreement.

Unless otherwise stated above, this Agreement is effective on the date of last signature:

Contractor's Legal Name	
Contractor's Authorized Representative's Printed Name	Title
Signature	Date

ISWCC's Administrator Printed Name	
Signature	Date

## Exhibit A

### SCOPE OF WORK-Sample Analysis

The following is a detailed overview of the requirements and procedures for sample analysis services for the Post-Harvest Deep Soil Sampling Project (PHDSSP). A more thorough description of these requirements and procedures including the definition of terms and the forms (attachments) referred to herein are in Exhibit C (Quality Assurance Project Plan (“QAPP”)).

#### 1. General Requirements:

- 1.1. For each sampling site, the Contractor shall analyze the zero to one (0-1) foot sample for pH, salts, sodium, cation exchange capacity (CEC) excess lime, organic matter, organic nitrogen, macronutrients (nitrate, phosphorus, potassium, calcium, magnesium, and sulfate), and micronutrients (zinc, iron, manganese, copper, and boron).
- 1.2. The Contractor shall analyze soil samples taken below one (1) foot for nitrate, ammonium, and phosphorus only.
- 1.3. The Contractor shall complete a Chain of Custody (COC) form (QAPP, App. A) for each batch of consolidated soil samples submitted for analysis.
  - 1.3.1. The original copy or scanned image of the COC shall be sent to ISWCC at sample receipt or with reporting of results.
- 1.4. The Contractor shall submit the analytical lab report (including QA/QC results) to ISWCC within three (3) weeks from the date of the analyses.
- 1.5. The lab report must indicate the date and time of analysis for each sample.
- 1.6. The lab report must include the results of all of the soil analyses either in spreadsheet format or individual sheets.
- 1.7. Completed reports shall be submitted to  
Carolyn Firth  
Idaho Soil and Water Conservation Commission  
1361 E. 16th St.  
Burley, ID 83318  
Email: Carolyn.Firth@swc.idaho.gov

#### 2. Analytical Method Requirements:

- 2.1. The Contractor shall meet the following requirements for soil sample analysis:
  - 2.1.1. Nitrate-Nitrogen - Either of the following two (2) analytical methods are acceptable for measuring Nitrate-Nitrogen:
    - 2.1.1.1. Method: Cadmium Reduction
      - 2.1.1.1.1. Reporting Limit: 1 mg/Kg or lower
      - 2.1.1.1.2. Method Reference: Cadmium Reduction Method, S-3.10, Western States Laboratory Proficiency Testing Program: Soil and Plant Analytical Methods, 3rd Edition, 2005, From: Plant, Soil, and Water Reference Methods for the Western Region. 1994, R.G: Gavlak, D.A. Horneck and R.O. Miller, WREP 125.

- 2.1.1.2. Method: Automated Cadmium Reduction (with extraction step added for application to soil samples)
    - 2.1.1.2.1. Reporting Limit: 1 mg/Kg or lower
    - 2.1.1.2.2. Method Reference: 4500-NO3. F, 1987. Annual Book of ASTM Standards, Vol. 11.01. American Soc. Testing & Materials, Philadelphia, Pa.
  - 2.1.2. Ammonium-Nitrogen
    - 2.1.2.1. Method: KCL Extraction / Exchangeable ammonium
      - 2.1.2.1.1. Reporting Limit: 1 mg/Kg or lower
      - 2.1.2.1.2. Method Reference: KCL Extraction / Exchangeable ammonium Method, S-3.50; Western States Laboratory Proficiency Testing Program: Soil and Plant Analytical Methods, 3rd Edition, 2005, From: Plant, Soil, and Water Reference Methods for the Western Region. 1994, R.G: Gavlak, D.A. Horneck and R.O. Miller, WREP 125.
  - 2.1.3. Phosphorous
    - 2.1.3.1. Method: Olsen Sodium Bicarbonate
      - 2.1.3.1.1. Reporting Limit: 1 mg/Kg or lower
      - 2.1.3.1.2. Method Reference: Western States Laboratory Proficiency Testing Program: Soil and Plant Analytical Methods, 3rd Edition, 2005, From: Plant, Soil, and Water Reference Methods for the Western Region. 1994, R.G: Gavlak, D.A. Horneck and R.O. Miller, WREP 125.
3. Custody and Handling Requirements:
- 3.1. The Contractor shall make arrangements with the ISWCC's soil sampling contractor to pick up the soil samples from the sampling contractor at a pre-determined, mutually agreeable location that is within the normal service area of the laboratory.
  - 3.2. The Contractor must complete a Chain of Custody (COC) form (QAPP, App. A) for each batch of samples delivered. The Contractor must ensure that the COC includes the date, time, sampler name, the Unique Identification Number (UIN), and sample depth for each sample.
  - 3.3. The soil sampling contractor relinquishing the samples and the Contractor receiving the samples must sign the COC.
  - 3.4. The "owner" and "client" information on the COC shall be the ISWCC, not the grower.
  - 3.5. The Agricultural Soil Submission Form (QAPP, App. A) received by the sampling contractor shall contain contact and billing information for ISWCC (not the grower/producer) and pertinent sample-specific information – sample identification number and the UIN.
  - 3.6. For delivery to the Contractor's laboratory, the Contractor shall place the samples in a cooler with reusable ice substitutes or with ice. If ice is used, sample containers must be placed inside a waterproof bag to prevent contact with melting ice.

3.6.1. If the Contractor cannot analyze the sample within forty-eight (48) hours of sample collection, the Contractor must preserve the samples by methods acceptable for the analytical method and standard practice.

4. Quality Assurance Requirements:

- 4.1. The Contractor must be a laboratory that participates in the North American Laboratory Proficiency Testing Program (NAPT) and NAPT's Proficiency Assessment Program (PAP) for the methods listed above.
- 4.2. The Contractor shall report nitrate concentrations in parts per million (ppm) or milligrams per kilogram (mg/kg) and as pounds per acre (lbs/acre) for each consolidated sample.
- 4.3. The Contractor shall report assumptions used in conversion from ppm (mg/Kg) to lbs/acre.
- 4.4. The Contractor shall follow their standard operating procedures for maintenance and calibration of instruments or systems used for this project. The frequency of calibration must also be consistent with industry standard operating procedures.
  - 4.4.1. Laboratory instrument/equipment testing, inspection, and maintenance shall be performed and documented by the laboratory if/as required by the State of Idaho laboratory certification process.
- 4.5. The Contractor shall inspect and accept supplies per their standard operating procedures.
- 4.6. The Contractor shall supply the ISWCC's soil sampling Contractor with new (not used), clean sample containers.
- 4.7. The Contractor is responsible for ensuring work is performed by personnel who are qualified to perform the work.
- 4.8. Upon ISWCC's request, the sampling contractor will submit performance evaluation samples (blind samples with known nitrate concentration) to Contractor for analysis. ISWCC may discuss the results of the analysis of the quality assurance samples with the contracted sampler and Contractor to determine the cause of problems and arrange for changes in procedures to achieve the data quality objectives.

**Exhibit B**  
**Cost and Billing Procedure**

1. ISWCC agrees to pay the Contractor a flat fee of \$65.00 for the analysis of the 1'–6' samples for each sample site. Payment is conditioned upon the analysis for each site being conducted in accordance with the requirements set forth in Exhibit A and Exhibit C. This includes a complete analysis of the top 1' sample and an analysis for nitrate, ammonium, and phosphorus on the 2-6' samples for each sample site. ISWCC agrees to pay the Contractor the above flat fee for the analysis of samples for up to a maximum of 77 sample sites.
2. Certain funding for the Post Harvest Deep Soil Sampling Project (PHDSSP) expires on June 30, 2017. In order for funding to be maximized, services in the amount of \$15,000 from Contractor and sampling contractor combined must be completed and invoiced by June 15, 2017. If \$15,000 worth of services are not completed and invoiced by June 15, 2017, the maximum number of sample sites for which ISWCC agrees to pay the Contractor to analyze shall be reduced to account for the loss of funds.
3. The Contractor shall provide a signed invoice to ISWCC at the beginning of each calendar month for services performed the month prior. No invoice will be accepted or paid without receipt of documentation. Invoices submitted without the required documentation will be returned to the Contractor for resubmission.
4. The Contractor must provide the following information with each invoice:
  - i. Contract Number: PHDSSP-02
  - ii. Name of project: Post Harvest Deep Soil Sampling Project
  - iii. Identification of billing period.
  - iv. Total amount billed for the billing period.
  - v. Detailed description of services, including number of fields sampled.
  - vi. Name of authorized individual and contact information for Contractor.

Invoices are to be submitted to:  
Idaho Soil and Water Conservation Commission  
322 E. Front St., Suite 560  
Boise, ID 83702  
Attn: Rhonda Yadon, Financial Manager

## EXHIBIT C

QUALITY ASSURANCE PLAN: DEEP SOIL  
SAMPLING PROJECT: MARCH CREEK, MINIDOKA  
AND TWIN FALLS NITRATE PRIORITY AREAS

# Quality Assurance Project Plan

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Deep Soil Sampling Project: Marsh Creek, Minidoka and  
Twin Falls Nitrate Priority Areas



**State of Idaho  
Department of Environmental Quality**

**Ground Water Program**

**Version 1.0**

**March 23, 2017**

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## 1 Title and Approval Page

### Quality Assurance Project Plan

Title: Deep Soil Sampling Project: Marsh Creek, Minidoka and Twin Falls Nitrate Priority Areas

Region/Division: Ground Water Program

Version Number: 1.0

Date: March 23, 2017

### Approval Signatures

Note: This QAPP becomes effective on the date of the last approval signature.

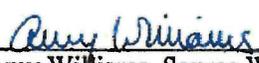
#### Program/Regional Manager - Department of Environmental Quality

Signature:  3/23/2017  
Name: Ed Hagan, Program Manager Date

#### Project Quality Assurance Officer - Department of Environmental Quality

Signature:  3/24/2017  
Name: Flint Hall, Environmental Scientist Date  
\*Note: At the time of QAPP signature, the project QAO is required to update the DEQ QAO project document tracker, found at TRIM Record #2012AEB8.

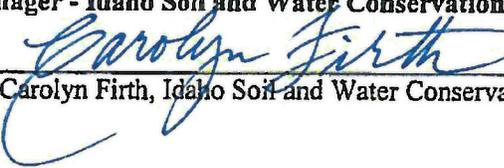
#### Project Manager - Department of Environmental Quality

Signature:  3/23/17  
Name: Amy Williams, Source Water Program Manager Date

#### Administrator - Idaho Soil and Water Conservation Commission

Signature:  3/24/17  
Name: Teri Murrison, Administrator Date

#### Project Manager - Idaho Soil and Water Conservation Commission

Signature:  3/24/17  
Name: Carolyn Firth, Idaho Soil and Water Conservation Commission Date

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### **Appendices**

- Appendix A. Field Data Collection Forms
- Appendix B. Nitrate Priority Area Maps and County FIPS Codes
- Appendix C. Project Checklists
- Appendix D. Procedures

### 3 Distribution List

At a minimum, the following personnel and analytical laboratory contacts will receive either an electronic or hard copy of the final signed quality assurance project plan (QAPP) (Table 1).

**Table 1. Project QAPP distribution list.**

<b>Name</b>	<b>Project Affiliation</b>	<b>Organization and Address/Location</b>	<b>Contact Number, e-mail</b>
Don W Zaroban, PhD	DEQ Quality Manager	DEQ—Director's Office	(208) 373-0405 Don.Zaroban@deq.idaho.gov
Ed Hagan, PG	Program/Regional Manager	DEQ—State Office Ground Water Program Manager	(208) 373-0356 Ed.Hagan@deq.idaho.gov
Flint Hall, PG	Project Quality Assurance Officer	DEQ—Idaho Falls Regional Office	(208) 528-2650 Flint.Hall@deq.idaho.gov
Amy Williams, DEQ, Carolyn Firth, ISWCC	Project Manager, DEQ  Project Manager, ISWCC	DEQ—State Office, Source Water Protection Program ISWCC,	(208) 373-0115 Amy.Williams@deq.idaho.gov (208) 678-1225 X110, Carolyn.Firth@swc.idaho.gov
Teri Murrison	Administrator, ISWCC	322 E Front Street, Suite 560 Boise, ID 83702	(208) 332-1790 Teri.Murrison@swc.idaho.gov
Ralph Fisher, EPA	Nutrient Management Specialist, EPA, Technical support	EPA 950 W. Bannock St. Suite 900 Boise, Idaho 83702	(208) 378-5761 fisher.ralph@epa.gov
April Leytem, NRCS	Research Soil Scientist, Technical Support	USDA Agricultural Research Service 3793 N 3600 E Kimberly, ID 83341	(208) 423-6530 april.leytem@ars.usda.gov
Michael Clancy	Sampling Contractor	Ecopoint, Inc. 223 Center Street, Kimberly, ID 83341	(208) 596-8194
Cathy Bingham, Western Laboratories, Inc	Analytical Laboratory	Western Laboratories, Inc 211 Hwy 95, Parma, ID 83660	(208) 649-4360

## 4 Project/Task Organization

Key project personnel and their responsibilities are defined in Table 2. An organizational chart is provided in Figure 1.

The project staff duties and responsibilities described in Table 2 are not intended to be all inclusive; see sections 1.2.5 through 1.2.7 of the DEQ *Quality Management Plan* (QMP) (DEQ 2012a) for a more detailed description.

**Table 2. Key project personnel and associated responsibilities.**

Name	Project Title/Responsibility
Ed Hagan, PG	<p><b>Program/Regional Manager:</b> Note: The following description is <i>not all inclusive</i>; see section 1.2.7 of the DEQ QMP for a more detailed description. This person is the regional manager or State Office program manager for the project. Duties and responsibilities include:</p> <ul style="list-style-type: none"> <li>• Assists in the review of the QAPP and signs the final QAPP as an approver.</li> <li>• Confirms the project QAPP meets the needs of the program/region.</li> <li>• Ensures the QAPP is approved prior to the start of project work.</li> <li>• Ensures the program/regional procedures and policies referenced in the QAPP are current and approved for use.</li> <li>• Performs all duties and responsibilities as assigned in the project QAPP.</li> <li>• Selects and assigns a project quality assurance officer (QAO), who meets the criteria for independence defined in the DEQ QMP (see QAO duties below), and obtains approval for this selection from the DEQ quality manager.</li> </ul>
Flint Hall, PG	<p><b>Project Quality Assurance Officer:</b> Note: The following description is <i>not all inclusive</i>; see section 1.2.5 of the DEQ QMP and the project QAPP for a more detailed description. Duties and responsibilities include:</p> <ul style="list-style-type: none"> <li>• Assists in the review of the QAPP, verifies the QAPP meets the requirements of the DEQ QMP, and signs the QAPP as an approver.</li> <li>• <i>All assigned QAOs are required to contact the DEQ quality manager to discuss the project prior to signing any project QAPP for approval. When the project QAO signs the QAPP for approval, the QAO is required to update the DEQ QAO project document tracker found at TRIM record #2012AEB8.</i></li> <li>• Performs an annual audit, using the QAO audit checklist located in Appendix B, on all assigned projects to evaluate project compliance with the approved project QAPP. Files the completed audit checklist in TRIM to document the audit.</li> <li>• Provides data validation per the project QAPP, using the appropriate checklist located in Appendix B, and may also participate in final project report review.</li> <li>• Documents all audit and data validation activities in the DEQ TRIM system, per the DEQ QMP and the approved QAPP.</li> <li>• In matters of project quality, this individual has a direct line of communication to the DEQ quality manager.</li> <li>• Must meet the following independence criteria: The QAO shall not be the project manager, program manager, or be otherwise assigned to the project data generation efforts. Neither the project manager nor the QAO may directly report to the other within the DEQ organizational structure, and both of these individuals may not be directly supervised by the same person.</li> <li>• Performs all other duties and responsibilities as assigned in the project QAPP. The duties and responsibilities of the project QAO also apply to any field sampling plan (FSP) generated under the project QAPP, unless an FSP-specific QAO is assigned and approved.</li> </ul>
Amy Williams, DEQ, Carolyn Firth, ISWCC	<p><b>Project Manager - DEQ:</b> Note: The following description is <i>not all inclusive</i>; see section 1.2.6 of the DEQ QMP and the project QAPP for a more detailed description. Duties and responsibilities include:</p> <ul style="list-style-type: none"> <li>• General role is to complete responsibilities related to adherence to DEQ QMP and contracting requirements.</li> <li>• Oversees subgrant agreement with Idaho Soil and Water Conservation Commission, ensuring adherence to contract requirements. Completes required subgrant regular reporting requirements.</li> </ul>

Name	Project Title/Responsibility
	<ul style="list-style-type: none"> <li>• Signs the final QAPP as an approver. Enters the approved and current project QAPP in the TRIM system, including a copy of the signed approval page.</li> <li>• Ensures all project work is conducted in accordance with the DEQ QMP, the approved QAPP, and the applicable project operating procedures.</li> <li>• Performs data review and verification per the project QAPP, using the appropriate checklists located in Appendix A</li> <li>• Reviews the project QAPP/FSP and standard operating procedures (SOPs) annually to determine if revision is necessary. If the project QAPP, FSP, or associated SOPs do require revision, the project manager initiates such action. All such documents will be revised, reviewed, and approved in accordance with the DEQ QMP.</li> <li>• Documents all audit and data review/verification activities in the DEQ TRIM system, per the DEQ QMP and approved QAPP.</li> <li>• Ensures all appropriate project and tracking documentation are maintained in TRIM.</li> </ul> <p><b>Project Manager - ISWCC:</b> Note: The following description is not all inclusive. Duties and responsibilities include:</p> <ul style="list-style-type: none"> <li>• General role is to complete responsibilities related to adherence to DEQ subcontract agreement and completion of field work in accordance to the approved QAPP/FSP.</li> <li>• Performs overall project planning, document development and approval, sample planning and coordination, laboratory coordination, reporting functions, and project report/summary development.</li> <li>• Generate and implement a contract with a selected contractor to collect and analyze soil samples.</li> <li>• Ensures that ISWCC/subcontractor Personnel assigned to this project are appropriately trained and qualified,</li> <li>• Work with the contractor and the producers to identify specific fields and sampling sites for each participating producer.</li> <li>• Develop and implement a data base management procedure to store and protect data confidentiality for participating producers.</li> <li>• Generate published soil survey maps and interpretations for each selected field. Provide that information to the contractor.</li> <li>• Provide guidance and oversight to the contractor to insure implementation of all phases of the sampling, analysis, and data management procedure as required.</li> <li>• Review the laboratory analysis of soil samples with each producer when received from the contractor and as necessary determine additional nutrient and/or irrigation planning and implementation strategies.</li> <li>• With the assistance of the Soil and Water Conservation Districts and the Ground Water Quality Improvement Committees, develop and implement a public information program to ensure public and producer awareness and understanding of the project, as needed.</li> </ul>
<p>Michael Clancy,                      Ecopoint, Inc.</p>	<p><b>Project Staff/sampling subcontractor:</b> This is the primary contact the subcontractor for soil sample collection and for interface with the</p> <ul style="list-style-type: none"> <li>• Contacts and coordinates with producers to facilitate sample collection</li> <li>• Ships samples to the laboratory, Completes field sample forms and provides to ISWCC</li> </ul>
<p>Cathy Bingham,                      Western</p>	<p><b>Laboratory Contact/Manager:</b> This person is the primary contact at the laboratory for DEQ/ISWCC project staff</p> <ul style="list-style-type: none"> <li>• The laboratory contact/manager issues sample receipts, and verifies analysis,</li> </ul>

Name	Project Title/Responsibility
Laboratories, Inc	and confirms the laboratory data review. <ul style="list-style-type: none"> <li>• Provides web interface for Grower/Producers to access soils results</li> </ul>
April Leytem, NRCS	<b>Project Staff: Soil Sampling/Analysis Technical Support</b> <ul style="list-style-type: none"> <li>• Provides PE samples and technical support for laboratory analyses</li> </ul>

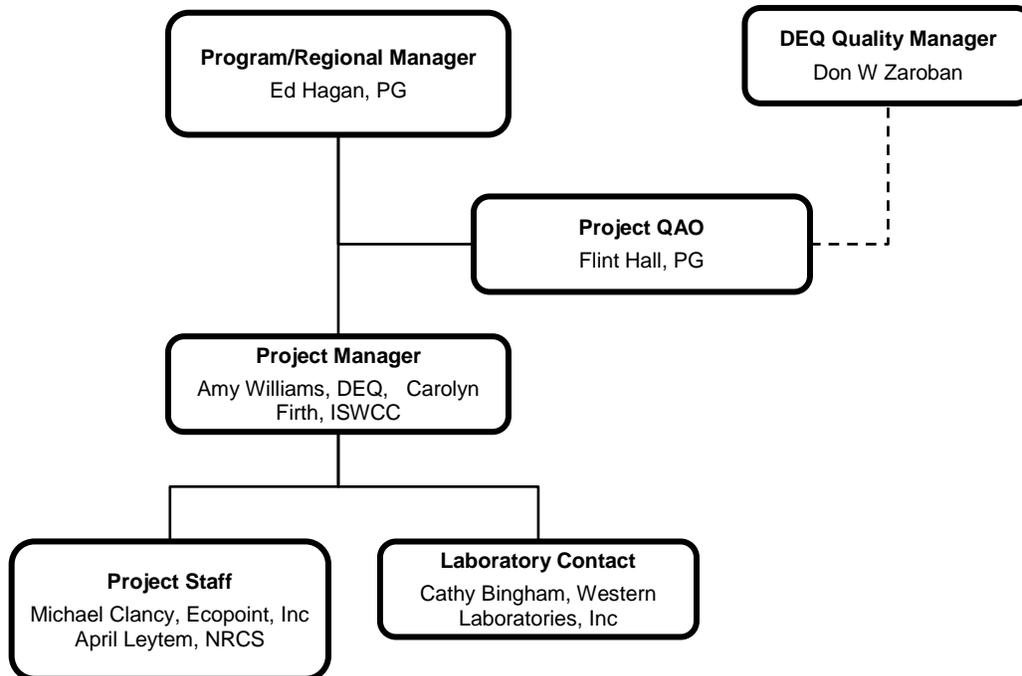


Figure 1. Project organizational chart.

## 5 Problem Definition/Background

Nitrate is one of the most widespread ground water contaminants in Idaho and the most common contaminant found in public water supply systems. High levels of nitrate in drinking water are associated with adverse health effects.

The Idaho Department of Environmental Quality (DEQ) has established a goal of restoring degraded ground water and protecting public drinking water sources. To facilitate achieving this goal, DEQ has developed a list of degraded ground water areas within the state of Idaho. This list focuses on nitrate and ranks the top 34 nitrate-degraded areas (referred as nitrate priority areas or NPAs) in the state based on the severity of the degradation; the rank of “1” indicates the most severely impacted area.

The Marsh Creek area, located in Cassia County, is the #1 ranked NPA on the most current list of degraded areas (2014). Minidoka NPA is ranked #25, and Twin Falls NPA is ranked #21.

## 5.1 Problem Statement

To affect improvement in ground water, DEQ partners with others, including the Idaho Soil and Water Conservation Commission (ISWCC) to evaluate effectiveness of efforts to reduce impacts to degraded ground water and to restore water quality.

The Idaho Soil and Water Conservation Commission (ISWCC) proposes to conduct post-harvest deep soil sampling (PHDSS) on fields located within the Marsh Creek, Minidoka, and Twin Falls NPAs to help interested land users see the relationship between management practices applied on a specific field and ground water quality impacts.

The ISWCC Post Harvest Deep Soil Sampling Project (PHDSS) will assist in demonstrating the relationship of applied nutrients and irrigation water in a field to ground water quality. This study does not directly monitor the application rates or efficiency of applied irrigation water; instead it focuses on the final results of applied nutrient and irrigation water of soil test nitrogen concentrations. Demonstration of the qualitative results of nutrient management practices will provide the basis for educating agricultural producers to the effectiveness of their nutrient and irrigation water management in maintaining nutrients within the crop rooting depth.

Application of nutrients in excess of crop needs in concert with over application of irrigation water results in excessive concentration of nitrogen below the root zone. Nitrogen found below the root zone at the end of the growing season is symptomatic of imperfect nutrient and irrigation water management techniques applied to the field through the growing season and from previous applications. Measuring deep soil nitrate may help identify activities that contribute to nitrate ground water contamination and provide relatively quick feedback on the effectiveness of changes to management practices designed to reduce ground water contamination.

Initial deep soil sampling will be conducted for the purposes of:

- Establishing baseline data: Provide field specific baseline data regarding the nitrogen content (nitrate, and ammonium) of soils underlying a variety of soil, crop, nutrient sources, and irrigation systems within the project area.
- Educating producers: Provide the foundation for a technically based education program. The intent of the project is to provide field specific information to producers that they will use to evaluate their current nutrient and irrigation water management practices and if necessary modify those practices leading to reduced soil test concentrations and ultimately, improved ground water quality.
- Serving as a pilot project: Provide information about project design, practical realities, time requirements and costs that can be used in developing subsequent project scopes.

## **5.2 Intended Usage of Data**

The intent of this project is to provide an improved understanding of the correlation between residual nutrients, current production methods, and areal extent of regions of nitrate degraded ground water. Information will be collected in a manner that will aid those that participate in improving their farming practices and well as ensures confidentiality as required by law. Sample results and recommendations will be reported back to the participants.

Information gained will be used to increase public awareness of the project through various means and will be used to guide education and communication efforts. Summary reports will be provided to DEQ.

## **6 Project/Task Description**

### **6.1 General Overview of Project**

Deep soil sampling will be conducted initially for one growing season to collect baseline information. Deep soil sampling may be repeated in future years, as funding allows, allowing analysis of the effects of changing management practices.

The deep soil sampling project will be implemented by the Idaho Soil and Water Commission and is summarized as follows:

1. Grower participation will be solicited by general mailings and outreach by the ISWCC, local conservation districts, the Cassia County/Minidoka County Ground Water Quality Improvement Committee and the Twin Falls County Ground Water Quality Management Advisory Committee members.
2. Producer confidentiality: The ISWCC will develop a process for data collection and analysis designed to separate the identity of participating producers and the specific locations of the sample sites from data and analysis generated. Part of this process is the use of a unique identification number (UIN) system. Soil samples and results from the analysis will be identified only by the UIN.
3. Completion of a Deep Soil Sampling Program Questionnaire by the grower that includes information specific to an individual field such as pertinent management information including cropping systems, nitrogen sources and amounts, historical yields, irrigation practices and application methods (Appendix A). Unless the producer includes identifying information on the questionnaire, the questionnaire will only be identified with the UIN.

4. Soil sampling and analysis will begin in pre-fertilization, spring, 2017. Soil samples will be:
  - Taken prior to fertilization prior to planting in the spring, and after crop harvest but prior to nitrogen applications where possible.
  - It's desirable to sample the same fields pre-fertilization and post-harvest, dependent on availability and permissions.
  - Collected at 1-foot increments from 0 feet to a depth not exceeding 6 feet, or to the depth of refusal, such as basalt, gravel or caliche that defines the limits of a shallower potential root zone.
  - The 0-1 foot soil sample will be analyzed for pH, salts, sodium, CEC, excess lime, organic matter, organic nitrogen, macronutrients (nitrate, phosphorus, potassium, calcium, magnesium, and sulfate) and micronutrients (zinc, iron, manganese, copper, and boron).
  - Soil samples taken below 1 foot will be analyzed for nitrate, ammonium, and phosphorus only.
  - Soil descriptions will be recorded in the field, and the NRCS Soil Series will be identified and documented.
5. Sampling and analysis will be performed by qualified firms which will be contracted to ISWCC.
6. ISWCC will analyze results from soil sampling to identify the risk of nitrate leaching posed by the various soil/cropping/irrigation systems.
7. Generalized technical data and results will be provided to DEQ as part of a summary report, but grower specific information will not be provided to DEQ. Locational and Grower/Producer information will be kept separated from soil sampling and questionnaire results by a Unique Identification Number (UIN) supplied to the grower.

## 6.2 Project Timetable

The overall project timeline is presented in Table 3. This time includes project planning and preparation, execution of the soil sampling campaign, with sampling, and related data gathering, analysis and reporting. Constraints on this schedule includes time required for initial documentation preparation, weather conditions impacting spring field preparation and planting, as well as factors governing the harvest and scheduling with the sampling contractor and analytical lab. The timetable is also constrained by the contractual obligations for the DEQ funding source. The intent of this project is to document a single growing season with the potential for follow-up to future growing seasons.

**Table 3. Project timetable.**

<b>Project Team</b>	<b>Initials</b>	<b>Activity</b>
Ed Hagan	EH	Program Manager
Amy Williams	AW	Project Manager, DEQ
Carolyn Firth	CF	Project Manager, ISWCC
Flint Hall	FH	Project QAO
Soil sampling Subcontractor	SC	Coordination/contact with producers, Soil sampling
<b>Estimated Dates</b>		<b>Tasks</b>
Mar 2017	All	Plan approval
Mar - Apr 2017	CF	Complete scope of work for sampling contractor
Apr 2017	CF	Work with contractor, local SWCC to identify producers and fields for inclusion in study, recruit participants
Apr – May 2017	SC,CF	Collect samples, submit to lab, CF- provide oversight
May 2017	FH	Field observation, audit
May – Aug 2017	CF	Receive questionnaires, Review soil analysis results
Aug – Nov 2017	SC,CF	Post-harvest sample collection, submit to lab, CF- provide oversight
Oct – Nov 2017	CF	Review soil analysis results, communicate to producers
Nov – Dec 2017	CF	Produce final report for DEQ
Dec 2017	AW, EH	Review and approve final report
Dec 2017	FH	Complete QA reporting and review

## 7 Quality Objectives and Criteria

This section of the project QAPP defines the project data quality objectives (DQOs), essentially defining the requirements to support the qualitative or quantitative design of the data collection effort. DQOs are also used to assess the adequacy of the data (new or existing) in relation to their intended use. Data quality indicators (DQIs) are used to describe, in part, the specific measurement elements to be used when evaluating data in support of the project DQOs. Project staff can find additional information and guidance concerning the DQO process and DQI selection and definition in the following reference materials:

- EPA *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA 2006c)
- EPA *Guidance for Quality Assurance Project Plans* (EPA 2002a)
- EPA *Requirements for Quality Assurance Project Plans* (EPA 2001).
- EPA *Guidance on Environmental Data Verification and Data Validation* (EPA 2002b)

The objective of quality assurance and quality control (QA/QC) is to ensure that analytical results obtained by soil sample analyses are representative of actual chemical and physical composition of the soil. Field QA/QC will consist of following a standard protocol for sample collection and collecting and analyzing sample duplicates/ replicates and performance evaluation (PE) samples or “known samples”. The duplicates are used to determine both field and laboratory precision. The PE samples will be “knowns” consisting of samples of local soil matrix analyzed by USDA, ARS, and provided to the sampler by ISWCC. Both the duplicate and PE samples will be stored and handled in the same manner as the normal samples, and submitted blind (without reference to their identity as QC samples). Project goals and sampling conditions do not require additional field QC samples. All QC samples will be submitted “blind” (i.e., not identified as a QC sample). Ideally, at least one set of field QC samples will accompany each sample shipment.

Field QC samples for this project will comprise at least 10% of all samples.

**Level I:** This refers to field observations, screening, assessments or analyses, including those using portable instruments, and results are commonly not compound-specific or quantitative. Generally, Level I data are related to activities such as locating sample collection points for laboratory analysis and are associated with instruments such as photoionization detectors (PIDs).

- **Generally associated verification/validation stage:** Level I may be associated, depending on data user requirements, with “Stage 1” verification and validation checks as described in Appendix B, Section 1.1, of EPA’s *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009).

**Level III:** This level refers to standard EPA-approved methods that may be equivalent to Level IV methods (see below), with the exception that the level of documentation supplied with analytical results is frequently less robust.

- **Generally associated verification/validation stage:** Level III may be associated, depending on data user requirements, with “Stage 2A” or “Stage 2B” verification and validation checks as described in Appendix B, Sections 1.2 and 1.3, respectively, of

EPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009).

Data collected in support of this project will consist of Field screening data (e.g., field measurements, assessment of soil properties – color, texture, moisture content, including results from participant questionnaire) and are considered data quality Level I (field parameter/screening level data).

Laboratory analytical data (i.e., data from samples submitted to a laboratory for analysis) are at data quality Level III (standard laboratory procedures and data reviewed by standard QA protocols).

## 7.1 Data Accuracy, Precision, and Measurement Range

**Accuracy** is a measure of the agreement between a “true” or reference value and the associated measured value. This sampling campaign will include spiked Performance Evaluation (PE) samples with a known matrix submitted blind to the laboratory. Recoveries of Laboratory Control Samples (LCS), and laboratory matrix spikes, and surrogate spikes may also be reviewed to evaluate the accuracy of the measurements. These recoveries are typically calculated as “percent recovery” (%R) represented by Equation 1 and Equation 2.

$$\%R = C_M / C_T \times 100$$

**Equation 1. Spiked sample or LCS percent recovery.**

Where:  $C_M$  = measured spike/LCS concentration  
 $C_T$  = true spike/LCS concentration

$$\%R = (C_S - C_{US}) / C_T \times 100$$

**Equation 2. Matrix spike and surrogate recoveries.**

Where:  $C_S$  = measured concentration of spiked sample  
 $C_{US}$  = measured concentration of unspiked sample  
 $C_T$  = true concentration of spike added

Laboratory accuracy for each analysis is determined through statistical analysis of the laboratory equipment by the laboratory; the acceptable accuracy range for the laboratory equipment will be indicated in the laboratory sheets. Any outliers from the acceptable range in percent recovery, as determined by the laboratory, will be flagged by the laboratory. Accuracy requirements for this project are  $\pm 20\%$ , and will be assessed from laboratory quality assurance information.

**Precision** is a measure of agreement between two measurements of the same property under prescribed conditions. Sampling campaigns may include duplicate samples (field replicates or split samples—see section 14) or may rely on LCS split sample results. The relative percent difference (RPD) of duplicate samples will be used to assess data precision. For laboratory duplicates, field duplicates, and matrix spike duplicates, Equation 3 will be used to calculate RPD:

$$RPD = \frac{(C_1 - C_2)}{(C_1 + C_2)/2} \times 100$$

**Equation 3. Relative percent difference (RPD).**

Where:  $C_1$  = concentration in first sample  
 $C_2$  = concentration in the second/duplicate sample  
Where both  $C_1$  and  $C_2 > 5$  times the laboratory method detection limit (MDL)  
Where one or both  $C_1$  and  $C_2$  are  $< 5$  times the MDL, the results will be considered within control limits where  $C_1$  and  $C_2$  are  $\pm$  MDL.

Precision will be based on field duplicates and “known” samples with an RPD goal of  $\pm 20\%$ .

Appropriate **measurement range** is determined by reviewing results with comparison to the laboratory reporting levels or MDLs. Reporting requirements are determined prior to sampling through review of historical data for the analytes and region of interest and reflected in choice of analytical laboratories, analysis methods, and requested reporting levels or MDLs.

## 7.2 Data Representativeness

Representativeness is the degree to which the sample data accurately and precisely represent site conditions. The representativeness criterion is best satisfied by confirming that sampling locations are properly selected, sample collection procedures are appropriate and consistently followed, a sufficient number of samples are collected, and analytical results meet data quality objectives. All sampling procedures will follow the sampling procedure in Appendix D. Representativeness is evaluated during data review, verification, validation, and reconciliation efforts by comparing the combination of data accuracy, precision, measurement range, and methods and assessing other potential sources of bias, including sample holding times, reported results of blank samples, and laboratory QA review.

## 7.3 Data Comparability

Comparability is the confidence with which one data set can be compared to another data set. Using standard sampling and analytical procedures will maximize comparability. To ensure data comparability, sample collection procedures (included in Appendix D) will be consistently followed, appropriate analytical procedures will be used, and the same laboratory will be used to analyze the samples for pre-fertilization and post-harvest throughout each project. Sample collection, handling, and analysis methods will be constant with similar projects such as the Yakima Lower Yakima Valley deep soil sampling project, and Shoshone-Bannock deep soil sampling project.

## 7.4 Data Completeness

Completeness is the percentage of valid data relative to the total possible data points. For data to be considered valid, it must meet all of the acceptance criteria, including accuracy and precision, and any other criteria specified by the analytical method used. The overall data quality objective for completeness for the sampling events conducted under this QAPP is 80%, based on the number of producers and fields contacted for sampling verses the number of fields with valid sample results. If the sampling event does not meet the quality assurance goal of 80%, the data will be discussed with the program manager and a course of action agreed upon. Any required departure from this goal will be justified and explained in the project records in accordance with the QMP.

## 8 Special Training/Certification

All specialized or non-routine training, qualifications, or certifications necessary for project and/or laboratory staff is listed below.

The project manager is responsible for ensuring that personnel assigned to this project are appropriately trained and qualified, with the appropriate training records on file with DEQ human resources.

All work performed by DEQ personnel will be conducted in accordance with the *Idaho General Safety and Health Standards* (Division of Building Safety 2006).

Field sample collection will be accomplished by a subcontract. That subcontractor will have all applicable certifications and will conduct their work according to standard operational and safety practices.

- No specialized or non-routine training for soil sample collection associated with this project is required; DEQ and ISWCC staff will be familiar with applicable methods and SOPs as referenced in this QAPP.

## 9 Documentation and Records

Project Quality Assurance documents and final reports will be filed electronically in TRIM in accordance with applicable program filing procedures. The project manager is responsible for ensuring that a copy of the current approved (and signed) project QAPP, with related FSPs and standard operating procedures (SOPs), is available in the DEQ TRIM electronic records management system. A copy of the signed signature page for the project QAPP and FSP (if used) is to be filed in the TRIM system by the project manager. Preferably, the approved document, including the signed signature page, is attached to the TRIM record in PDF format. Field data collection, soil sample results and producer questionnaires will be maintained by ISWCC and will not be included in DEQ record keeping.

Field personnel shall use the field data collection forms included in Appendix A to document each day's activities. An additional field log book may be utilized to record pertinent information not captured in the provided data collection forms. Information is to be recorded as follows:

- Project data must be recorded directly, promptly, and legibly.
- Field logbook or field sheet entries must be made in black or blue permanent ink and must be signed/initialed and dated by the person making the entry.
- Changes or corrections to field logbook notes and/or data must be indicated with a single line through the original entry. Changes must be initialed, dated, and explained. A field sheet may be discarded and information reentered on a new data sheet if needed.

All documentation necessary to support the objectives of the project and the validity of project data— field records including grower questionnaire, chain-of-custody forms, laboratory reports, field notes, field logbooks, etc., and QAPP, FSP, audit reports—shall be retained. The QAPP, any FSP developed, Annual project audit and assessment documentation, per the DEQ QMP, shall also be entered into the DEQ TRIM document system by the project QAO and/or the project manager, as applicable in accordance with the current approved DEQ records retention schedule (TRIM record #2010AIC3). Field records will be maintained by ISWCC in an appropriate manner that maintains data integrity and meets security and retention set forth in the Idaho Soil and Water Conservation Commission Records and Retention Manual.

## **10 Sampling Process Design**

The intent of sampling is to provide for agricultural producers a correlation between nutrient management practices for specific fields and potential ground water quality impacts. The design presented for this sampling provides a template that may be applicable in other regions for addressing the question of residual soil nitrates following a growing season.

Sample design includes rationale for site selection and a structure for sample project design and management. Rationale for sample site selection, identification, handling, analysis and reporting is presented in the following sections.

### **10.1 Rationale for Selection of Sampling Sites**

Grower participation is voluntary and will be solicited by general mailings and outreach by the ISWCC, local conservation districts, and the Cassia/Minidoka Ground Water Quality Improvement committee and the Twin Falls Ground Water Quality Improvement committee. Growers will be encouraged to participate and to propose fields for sampling.

Selected fields will be chosen to provide a representation of crop and field conditions within the nitrate priority area and field-specific data including application of animal waste and/or commercial fertilizer. The total number of sites is constrained by the available budget, grower response, and timing and availability for sample collection.

Locations for sampling will be constrained by proximity to Nitrate Priority Areas and modeled model ground water source delineations produced by DEQ. Fields selected for soil sampling will be located within or near (1/4 mile) of an identified ground water source delineation as determined for Source Water Assessments (SWA) and within or near (1/4 mile) of the Marsh Creek, Minidoka, or Twin Falls NPAs. A goal of 60 fields for soil sampling is set for the 2017 growing season. These should be distributed approximately equally for the Marsh Creek NPA in

Cassia County, the Minidoka NPA in Minidoka County, and Twin Falls NPOA in Twin Falls County – 20 sites per NPA/County. Maps of the referenced NPAs, counties with corresponding SWA ground water delineations are presented in Appendix A. In addition to the planned number of sample sites per NPA, 2 duplicate locations and one PE (Performance Evaluation, also known as “spiked” or fortified) sample will be collected for each of the NPA/Counties – a total of 3 quality control (QC) samples per NPA/County, and 9 QC samples overall.

## 10.2 Sample Design Logistics

Sampling logistics for this specific project are presented in this QAPP. Sampling logistics for possible future sampling may be detailed in monitoring campaign specific Field Sample Plans that may be developed.

Specific producer/growers will be contacted by ISWCC based on input from the identified partners in Section 6.1, Item 1, and meeting the location criteria presented in Section 10.1. Those producers/growers agreeing to participate will be contacted by the soil sampling contractor and scheduled for sampling. ISWCC will provide the Deep Soil Sampling Program Questionnaire (Appendix A) to complete and return by mail to the ISWCC.

Site identification record keeping is designed to preserve to the degree possible confidentiality of the producer. The sampling contractor will provide each participant with a Unique Identification Number (UIN), generated at the time of sample collection following the pattern established by the ISWCC:

**CC – SS**

Where:

**CC** – Idaho county FIPS code: Cassia Co – 31, Minidoka Co – 67, Twin Falls Co - 83

**SS** – Serial site number; ex. 01, 02, 03 . . .

The UIN serial number will increment by 1 for each field. A grower/producer that has two fields will have consecutive UNI numbers: ex 31-01, 31-02 – if in the same county, or the next available serial number if fields in different counties are sampled. UIN numbers will be recorded on the Deep Soil Sampling Questionnaire and Sampling Field Form. A complete table of Idaho FIPS codes (Table B1) is included in Appendix B.

A sample site identified as a “duplicate” site will be assigned serial site numbers SS = 31 or 32. Samples submitted as PE sites will be assigned SS=33.

Sample identification for record keeping and custody control will use an indexing system based on the UIN described and a serial sample number per field based on sample depth interval. The following pattern for field sample number will be used:

**UIN – DD**

Where:

**UIN** - (CC – SS for the sample site)

**DD** – Representative depth interval:

0-1 ft – 01, 1-2 ft – 02, 2-3 ft – 03, 3-4 ft – 04, 4-5 ft – 05, 5-6 ft – 06

The sample number will be recorded on the Sampling Field Form, Sample Chain of Custody (COC) record, the Agricultural Soil Submission Form (laboratory request for analysis form), and on the individual sample container for that specific sample.

## 10.3 Sampling Schedule

The ISWCC and the producer will coordinate the sampling schedule for each field based upon the anticipated harvest date for the crop in that field the year of sampling. Samples will be taken as soon after harvest of the respective crop as possible (late summer and fall) and will be completed prior to: 1) Fall application of nutrients. 2) Irrigation to establish fall seeded crops. 3) Fall precipitation, as possible. Each sampling site will be sampled for baseline purposes once each year for the duration of the project, unless additional soil sampling is requested based on review of data by the producer or the ISWCC. Recent crop, nutrient, and irrigation actions will be recorded by Sampler.

## 11 Sampling Methods

### 11.1 Rationale for Selecting Soil Sampling Sites

The intent of soil sampling for this project is to assess generic field conditions for the purpose of surveying the effects of management practices employed by individual growers/producers. The ISWCC understands that it would be cost prohibitive to characterize each field to a level of detail necessary to identify all the variability within a field or to accurately quantify field-level leaching estimates. Sampling sites will therefore be selected to measure effects of management practices for the field conditions.

Sample sites within a selected field will be selected recognizing the following two expected sources of sample variability within that field:

**Generic Variability:** Generic conditions exist which create variability in all fields. Examples include field border effects, cultivation patterns, and position relative to an irrigation system. A

minimum of 100 feet shall be established as a setback from field edges, field entry points, water features such as ditches, ponds, waterways or drainage ditches, etc.

**Field Specific Variability:** Factors that cause field specific variability include soil type, topography, and management practices. Selecting a sample site with relatively uniform conditions will be the responsibility of the contract sampler and the grower. While resources are available to aid the grower, most growers have intimate knowledge of their fields and are best suited to select the locations of average field conditions. The contract sampler insures that sampling sites will be representative of the field or management unit being sampled.

Specific soil sample locations will be determined with input from the grower, the sampler and the ISWCC representative. Detailed soil survey maps and interpretations will be generated by the ISWCC using a USDA published or online soil survey for each field as further guidance for specific site selection. The sampling zone will be located on the soil survey map within the predominant soil type(s) of the field deemed to be representative of the management program and physical attributes of the field.

## 11.2 Definition of Terms Pertinent to Soil Sample Collection

Standard soil sampling methods rely on specific terms to guide sample collection. The soil sampling contractor will adhere to the following definitions for these pertinent terms:

**Borehole:** A borehole represents the point at which soil samples are obtained, one for each selected site. Six discrete soil samples are collected from each borehole, discrete samples being taken at the designated depths. Samples from the same depth for each of the 5 boreholes are mixed together to form a composite sample. Boreholes may be advanced by any method capable of collecting discrete samples over 1-ft intervals at the prescribed depths. Mechanized (e.g. pneumatic, hydraulic) sampling devices are required.

**Composited One-foot Sample:** Soil samples that represent each one foot sampling depth, mixed together to form one consolidated sample. A sample of the consolidated sample will be selected and provided to the laboratory for analysis.

**Conservation Planning or Field Location Maps:** Aerial photographs used for conservation planning purposes which are generally included in the producers' field specific conservation plan will be used to identify the location of selected fields in relation to the rest of the operating unit.

**Discrete Sample:** A one foot soil sample for each of the sampling depths retrieved from a borehole, prior to compositing.

**Published Soil Survey Descriptions:** Data and descriptions which identify and describe soil mapping units included on published soil survey maps.

**Published Soil Survey Maps:** Maps generally included in the producers conservation plan which delineate soil texture boundaries within a field. Maps are generated using USDA NRCS published soil survey data.

**Sampling Setbacks:** Those areas of the field that are automatically determined to be not representative of the average field condition and therefore inappropriate for sampling. Examples include field borders, first span of a center pivot, field entry points, and harvest haul roads.

**Sampling Site:** Five sampling sites will be selected within the Sampling Zone. The Sites will be located within the soil type of the field and deemed to be representative of the physical attributes of the field including soil texture, irrigation type, slope, water table, etc.

**Sampling Zone:** The field area available for sampling after the setbacks described above are taken into account.

### 11.3 Soil Sample Collection Methods

The soil sampling contractor will follow industry standard, direct-push, continuous sample collection methods utilizing a mechanized sampling tool (e.g. Giddings, AMS, GeoProbe) that can collect soil from discrete one-foot increments without cross contamination. Samples will be collected and information recorded following industry standard methods.

For each sample site, five continuous bore samples each representing 6 discrete, one-foot samples per bore will be collected, with a minimum of four boreholes within each sample site if limited by conditions. The minimum nominal diameter of the standard cores shall be approximately 1 ¾ - 2 inches; however, if refusal below a depth, as small as a 1-inch diameter core may be used. If refusal occurs prior to 6 feet, the sampler will record sampling depths that were reached and samples collected for that site on the Soil Sampling Field Form (Appendix A).

The discrete one foot samples from each borehole will be placed in clean plastic buckets (one for each depth interval) then mixed to consolidate the soil into one representative, composite one-foot sample to be analyzed. After compositing, a portion of soil in each quadrant of the bucket will be transferred to a lab-prepared sample bag. The sample bag will be clearly marked with the date and time of collection, the sampler's initials, and the sample identification number. Detailed soil survey maps and interpretations will be generated by the ISWCC using a USDA published or online soil survey for each field selected for the project. The sampling zone will be located on the map within the predominant soil type(s) of the field deemed to be representative of the management program and physical attributes of the field. The soil type will be identified on the Soil Sampling Field Form

If boreholes terminate at different depths, composite samples will be created by compositing available discrete samples (which may number less than four). During boring and soil collection, care should be taken to avoid mixing the soil from discrete one-foot depth increments with soils from shallower or deeper depths.

Following satisfactory collection of samples, boreholes will be backfilled by the sampler using tamped native soil to prevent creation of a vertical conduit.

## 11.4 Soil Sample Data Collection and Record Keeping

Project field information will be captured on the appropriate field forms (Appendix A). The soil sampling contractor will be provided with the Deep Soil Sampling Release Form, Deep Soil Sampling Program Questionnaire, Soil Sampling Field Form, Chain of Custody (COC) record and laboratory soil analysis forms. The soil sampling contractor will assign a UIN for each grower/producer and field sampled from a list of available numbers at the time of sampling, based on the appropriate county FIPS and serial site number. The soil sampling contractor will not maintain a correlation between the grower/producer contact information and the UIN. The grower/producer will be able to use this UIN to access their soil sampling results when available. Original copies of the release form, sampling program questionnaire, and field sample forms will be maintained by ISWCC, with the assigned UIN recorded on each. Original copies of the agricultural soil submission form and COC forms will be maintained by the analyzing laboratory and made available as per standard practice.

Variations on this or other aspects of the sample collection process can be updated in a FSP for future sampling campaigns.

QA/QC procedures as specified for sample collection will be followed by sampling personnel. The QA/QC procedures will be fulfilled by adhering to all requirements detailed in this QAPP. Such adherence will be demonstrated through appropriate documentation of sampling procedures within the field logbook or field sheets as described herein. Field audits by the project QAO may also be part of QA/QC procedures.

## 11.5 Safety and Liability

Because of the proposed sample depths, samplers should use mechanized sampling equipment, which is inherently dangerous. In addition to physical hazards of the equipment itself, there is the potential to intersect power and other utility lines that may lie above or beneath a sampling site. The sampler must call the utility notification center (information at <http://www.callbeforeyoudig.org>) and leave sufficient time for their response prior to field work. The grower must identify and record the location of utilities on private land and flag/stake any underground utilities in the field that are within 200 feet of the agreed sample site. Responsibility for personnel safety will reside with the sampling company. The sampler is responsible for damage to property of the cooperating grower caused by field sampling which is the result of negligence of the sampler. Property damage caused by negligence on the part of the sampler will be repaired by the sampler.

The grower/producer will agree to release ISWCC and the soil sampling contractor from liability for any damages, losses, or expenses arising from inaccurately identified locations for any underground private utilities, including but not limited to irrigation mainline, electrical lines, or any other structures.

## 12 Sample Handling and Custody

Soil samples will be delivered by contracted samplers to a contracted commercial laboratory or prearranged drop-off location. Sampling handling procedures as described in University of Idaho Bulletin 704 (Appendix D) (<http://www.cals.uidaho.edu/edComm/pdf/EXT/EXT0704.pdf>) will be followed to insure that sample collection, holding and preservation time requirements are met. Coordination will be made with the laboratory prior to sample collection. For delivery to the lab, samples shall be placed in a cooler with reusable ice substitutes or with ice. If ice is used, sample containers must be placed inside a waterproof bag to prevent contact with melting ice. At no time shall the sampler store samples for more than 48 hours. Samplers may dry samples using methods acceptable to the laboratories and consistent with analytical methods. If the laboratory cannot analyze the sample within 48 hours of sample collection, the laboratory must preserve the samples by methods acceptable for the analytical method and standard practice.

The sampler will complete an Agricultural Soil Submission form approved by the analyzing laboratory for sample from each site and a COC record (Appendix A) for sample shipment. The soil submission form will include contact and billing information for ISWCC (not the grower/producer) and pertinent sample-specific information – sample identification number and the UIN corresponding to the producer/grower and specific field. The COC will include the project name, UIN, field sample number, sampled depth interval and sampled date for each sample. The date and time that the sample relinquished custody, and samplers name/initials will be recorded on the form. Custody is relinquished when the sampler or their agent releases the sample container or cooler to a designated intermediary or common carrier for shipment to the laboratory, or directly to the analyzing lab. The lab will return the original copy or scanned image of the COC at sample receipt or with reporting of results, indicating the time and date of sample reception, with the receivers name. ISWCC will maintain a record of sample custody with their field records.

## 13 Analytical Methods

Samples collected will be analyzed by a laboratory meeting ISWCC requirements; participation in the North American Laboratory Proficiency Testing Program (NAPT) and NAPT's Proficiency Assessment Program (PAP) for the requested methods. Table 4 lists the requested parameters, reporting units, methods and method descriptions.

**Table 4. Parameters, Units, Analytical methods, and Method Descriptions.**

Parameter	Units	Analytical Method	Method Description
pH	Unit	S-2.10	1:2 Soil:Water Ratio
Soluble Salts	mmhos/cm		
Organic matter	%	S-9.10	LOI- Loss of Ignition
Lime	%	Fizz	Effervescence 2N HCl
Cation exchange Capacity - ECE	meq/100g	S-10.20	Measured
Nitrates – NO <sub>3</sub>	ppm	S-3.10	Cadmium Reduction/KCl Extraction - FIA
Ammonium – NH <sub>4</sub>	ppm	S-3.50	KCl Extraction/Exchangeable FIA
Potassium, Calcium, Magnesium, Sodium, Sulfate	ppm	S-5.10	Ammonium Acetate - ICP
Total Phosphorus	%	P-4.10	Nitric Acid/Peroxide Wet Ash
Zinc, Iron, Manganese, Copper	ppm	S-6.10	DTPA Extractable - ICP
Boron	ppm	S-6.10	DTPA Extractable/Sorbitol - ICP

*Notes:* mmhos/cm = micromhos/centimeter, ppm = parts per million, meq/100g = milliequivalents per 100 grams

FIA = Flow Injection Analysis, ICP – Inductive Coupled Plasma

DTPA = Diethylenetriaminepentaacetic acid

KCl = potassium chloride,

HCl = hydrochloric acid

## 14 Quality Control

Generally speaking, quality control is a means of measuring or estimating the potential variability involved with sample collection, analysis, or measurement activities in the field and in the laboratory. This section will discuss the various QC activities associated with this project

Adherence to this plan provides the framework to maintain quality control for the project. Quality assurance samples shall be analyzed and the results reported to ISWCC. The ISWCC contract with samplers and laboratories will allow the ISWCC to discuss results with the samplers and laboratories to determine the cause of potential problems and for development of corrective actions to address any irregularities with the result or entire sample collection and analysis process. Laboratories will perform standard internal quality control measures and will make available associated quality control information as needed.

Standard field quality assurance practices will be employed including duplicate/replicate and PE (fortified or “spiked” samples). Duplicate/replicate and PE samples will be submitted “blind” (not indicated as a QC sample)

### 14.1 Field QC Checks

Field QC samples, (duplicates and PE samples) will be submitted blind (not identified as a QC sample) for analysis. The overall field QC frequency will be at least 10% of the samples. Submission of QC samples will be scheduled to ensure that at least three PE samples or a set of duplicate samples will be included with each shipment of samples submitted to each laboratory. Field QC sample collection will be as evenly distributed as project conditions allow.

#### Duplicates

Duplicate samples are two samples collected from the same location, representing the same sampling event, and carried through all assessment and analytical procedures in an identical manner. Duplicates for this sampling project will consist of “splits” (subsamples drawn from the same initial volume of matrix). Sampling procedures outlined in [Appendix D](#) will be followed for each sampling event to ensure consistency in sample collection. All relevant information will be recorded for the duplicates, just like the normal samples, in the field logbook or field sheet. Results from the field duplicate analysis will be included in the analytical report.

#### Field, Trip, and Equipment Blanks and Field Spikes

A blank is a sample of known matrix where the specific constituents requested for analysis are known to be absent or are present at concentrations less than the laboratory minimum limit of detection.

**Field blanks** are samples of blank matrix prepared in the field under identical conditions, processed the same, and included for analysis as a regular sample. Field blanks are a QC check to identify potential problems with the sample collection, handling, and analysis process. Field blanks will not be included for this project.

**Equipment blanks** are blank sample matrix passed through or over non dedicated sampling equipment to check the decontamination process between samples or sample sites. Equipment

blanks may be collected when sampling equipment requiring decontamination (e.g., portable sampling equipment, mixing buckets, sampling shovel) are carried from field to field. When collected, equipment blanks will also be submitted blind for analysis and may be included in the overall 10% QC sample calculation. No equipment blanks will be required for this project. Soil sampling probe will be decontaminated by brushing clean of soil between borings. Sampling buckets for compositing samples will be cleaned between use and depth interval.

**Field spikes** are samples from a third-party vendor that include a known concentration of analytes of concern and may be submitted blind to the analyzing laboratory. These “spiked” samples may be included in the sample shipment to allow for an independent accuracy assessment or for inter-laboratory comparisons. Three PE “known” samples will accompany each sample shipment. PE samples will consist of local soil matrix analyzed by the ARS laboratory, Kimberly Id, for blind submission with field samples.

## 14.2 Laboratory Quality Control Checks

Laboratory QC checks are routinely performed as part of the analysis process. The frequency and type of QC samples are often analysis method-dependent and include reagent blanks, matrix spikes, and internal laboratory splits. Analyzing laboratories will report any variance from QC limits impacting the quality of sample results and may report details of internal laboratory QC if requested. The analytical laboratory may provide appropriate sample containers, COC forms, sample labels as used, and any necessary container seals. A summary of laboratory QA/QC and data reports will be included in the final report submitted to DEQ and filed in TRIM.

Laboratory QC checks include internal checks for sample analysis activities, duplicate samples, and blanks. The following paragraphs describe common components of laboratory QA/QC programs.

### Laboratory Blanks

A laboratory blank is a sample of known matrix where the specific constituents requested for analysis are known to be absent or are present at concentrations less than the laboratory minimum limit of detection. The laboratory blank is analyzed to evaluate the accuracy of the analysis.

**Laboratory control samples** (LCSs) are samples that contain a known concentration of analytes and are analyzed to assess the overall method performance. They undergo the same preparatory and determinative procedures as the project samples and are the primary indicator of laboratory performance. LCS recoveries are used to measure accuracy. The RPD for duplicate LCS recoveries is used to measure precision.

A **laboratory duplicate sample** is a sample that is split by the laboratory into two separate and identical samples. The two samples are analyzed and a comparison of the results (RPD) is used to assess laboratory precision.

A **matrix spike** (MS) sample has a known amount of the target analyte added to project matrix before analysis to assess possible matrix interferences on the analysis. Percent recoveries on MS samples should be compared to percent recoveries of LCS samples. An MS/**matrix spike duplicate** (MSD) pair can be used to assess precision.

### **14.3 Data Analysis Quality Control Checks**

The QC check data may be checked/reviewed for quality by the project manager or the project QAO at any time during the project and must be checked after all of the data are collected. Corrective actions, as needed, will be documented in the event that control limits are exceeded. Data qualifiers will be assigned following appropriate data verification/validation procedures. Any qualifiers added will be defined in the project summary/technical report and will be consistent with EPA QA/G-8 (EPA 2002b). The following checklists are included in Appendix C: Data Review—TRIM record #2012AEB2, Data Verification—TRIM record #2012AEB3, Data Validation—TRIM record #2012AEB4, and Project QAO Annual Audit— TRIM record #2012AEB5

## **15 Instrument/Equipment Testing, Inspection, and Maintenance**

Laboratory instrument/equipment testing, inspection, and maintenance are performed and documented by the laboratory if/as required by the State of Idaho laboratory certification process. Procedures and schedules for preventive maintenance of sampling equipment are the responsibility of the laboratory. Each instrument or item of laboratory equipment will be maintained periodically to ensure accuracy. These procedures and frequency of performance are designated in the individual instrument manuals.

Project field instrument/equipment testing, inspection, and maintenance will be performed in accordance with the individual instrument/equipment manual.

## **16 Instrument/Equipment Calibration and Frequency**

Laboratory instrument calibration is conducted and documented by the laboratories if/as required by the State of Idaho laboratory certification process.

Any field monitoring equipment utilized for the measurement of field parameters will be calibrated and maintained as recommended by the manufacturer, or as found in individual instrument/equipment manuals, to ensure accuracy within specified limits. Calibration details will be recorded in the field logbook or field sheet. Field equipment used to collect samples will be calibrated according to manufacturers' procedures or internal guidelines at the start of each field day (at a minimum) and/or at intervals recommended by the manufacturer or found in individual instrument/equipment manuals. Each instrument or item will be visually inspected by field sampling personnel for damage and operability prior to each sampling event.

## **17 Inspection/Acceptance of Supplies and Consumables**

The supplies and consumable items required for monitoring projects will be consistent with the appropriate sample collection procedure described in this document or included in Appendix D. All sample containers will be obtained from or approved by the the analytical laboratory,

laboratory supplier, or laboratory equipment provider. All sampling supplies and consumable items will be new, inspected for acceptance by the project manager prior to use, and used for sampling as per the approved procedure.

## 18 Nondirect Measurements and Data Acquisition

Nondirect measurements and data acquisition refer to data obtained *for use by the project* from existing data sources, not directly measured or generated in the scope of this project. This type of data is often referred to as “existing data.” Examples of this type of data include data obtained from existing sources or databases (either from within or from outside DEQ or ISWCC) and data obtained by others and offered or presented to DEQ or ISWCC.

Published Soil Survey Descriptions and Soil Survey maps are examples of these nondirect measurements and data use within this study. Soil Survey descriptions identify and describe soil mapping units included on published soil survey maps. These descriptions are used to delineate soil texture boundaries identified on soil survey maps generated using USDA NRCS published soil survey data. These data are used as guides to sample site selection as described in Section 10 – Sampling Process Design.

## 19 Data Management

Documentation of field and laboratory work for each soil sampling site will consist of submittal of the following documents to the ISWCC by the soil sampling contractor:

- A completed Sampling Field Form (Appendix A).
- Copies of soil survey maps and interpretive descriptions prepared or compiled by ISWCC, notes or related information collected by the sampler during the sampling process.
- A copy of the analytical results shall be made available to the grower/producer and provided to the ISWCC. All forms and related information will be maintained by the ISWCC to insure that minimum records necessary for technical analysis of the data, documentation to facilitate repeat sampling, and possible audit of financial data are available.
- The completed Grower Agreement, and Deep Soil Sampling Program Questionnaire.

The analyzing laboratory will make soil sampling results available to the ISWCC and the grower/producer thorough a secure web interfaced. The ISWCC will analyze soil test results and provide the grower any summary, direction or recommendations as deemed necessary by the ISWCC.

The ISWCC will summarize soil sample data for all samples taken during the year and provide DEQ the cumulated results identifying resource concerns and outlining intended remedial action.

The ISWCC will enter sample and analytical data into a computer database. Computerized data will include technical data necessary for interpretation of the results by the project. Such data will include sample ID, sample depth; sampling date; analytical results; and Soil Sampling Field Form (Appendix A).

Quality Assurance forms as completed: Data Review—TRIM record #2012AEB2, Data Verification—TRIM record #2012AEB3, Data Validation—TRIM record #2012AEB4, and Project QAO Annual Audit— TRIM record #2012AEB5 will be entered into TRIM as part of the DEQ QAPP recordkeeping.

## **20 Assessment and Response Actions**

Assessment of the project QAPP will be performed by ISWCC assessment of field notes and laboratory reports and by conducting field and laboratory audits where possible and resources allow. This assessment will be completed or directed by the QAO. Any errors or inconsistencies identified in the field notes will be discussed with ISWCC and corrective action suggested. The QAO will perform assessment of the project independently of the project manager.

A note to the file will be included with the field notes and laboratory reports if any follow-up QA activities regarding field notes or laboratory reports are required and conducted.

The QAO shall audit the QAPP annually for project that continue beyond one field season, per the DEQ QMP, to determine if revision is necessary. The project manager should also review the project QAPP on an annual basis to ensure that the document continues to meet the needs of the data user(s). Audits and reports shall utilize the appropriate checklist forms located in Appendix A and will be documented in TRIM, indicating the date of the audit and listing identified issues or concerns in accordance with the QMP. If the project QAPP and/or FSP requires revision as a result of this audit or review, these actions will be taken and the revised QAPP submitted for approval prior to implementation, per the DEQ QMP (DEQ 2012a).

## **21 Reports to Management**

As part of funding contract fulfillment for DEQ subcontract S544 (TRIM 2016AHR276), ISWCC will submit a final report including the following deliverables:

- A description of the project,
- A description of sampling procedures and protocols,
- A detailed table showing soil analysis results, cropping history, and fertilizer applications for each field sampled, and
- A summary table showing ranges of nitrate values and other parameters.

## 22 Data Review, Verification, and Validation

**Data review** will be conducted by the ISWCC Project manager and deliverables to DEQ will be performed by the DEQ Project manager

**Data verification** will be conducted by the ISWCC Project manager and deliverables to DEQ will be performed by the DEQ Project manager with support of the Project QAO as needed.

**Data validation** shall be conducted by the project QAO following data review and verification

**Data review, verification, and validation tasks are assigned to specific project staff, such as the project manager or project QAO, in section 23 of the project QAPP.**

The level of documentation required for a specific project data review, verification, validation, and reconciliation effort is specified below. This level of documentation is determined by the project manager, in consultation with the regional or program manager, consistent with the “graded approach” used by DEQ in implementing the quality management system (QMS).

Those assigned to perform project data review, verification, and validation *shall use the associated checklist provided in the appendices to perform and document* the effort in the associated project TRIM file system.

## 23 Review, Verification, and Validation Methods

Data review, verification, and validation efforts are based on the analytical support determined to be necessary in the planning stages of the project. DEQ personnel performing data verification and validation are encouraged to review the following guidance documents:

- EPA QA/G-8 (EPA 2002b) for guidance on methods for this task.
- Appendix A of EPA’s *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009)
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA 2004).
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (EPA 2008).

**Data review** for data and information collected under this QAPP shall be performed by the project manager(s) using the data review checklist found in [Appendix C](#). This review will also include evaluation of supplied laboratory data reports. Data review will include the following activities, at a minimum:

- An examination of project data, identifying errors in data entry, storage, calculation, reduction, transformation, or transcription.
- An examination to ensure all required sample information is documented and available, in preparation for the verification, validation, and assessment process. This includes pertinent project information concerning blanks, matrixes, temperature requirements, duplicates, preservatives, shipping dates, holding times, chain-of-custody records, etc.

- An examination to identify if all required nondirect measurement data (existing data) information *and supporting documentation*, as required by the project QAPP, have been received and are available for the verification and validation process.
- A completeness check to determine if any data deficiencies exist, such as missing data or compromised data integrity, due to issues such as loss in acquisition, storage, or processing.
- An examination to ensure all necessary analytical laboratory support documentation, as set forth and stipulated in the project QAPP, have been received from the applicable laboratories.
- An examination to identify programming and/or software related errors, if applicable to the project.

**Data verification** for data and information collected under this QAPP shall be performed by the project manager(s) using the data verification checklist found in [Appendix C](#). The general focus of the process is to identify if all requirements specified in the project QAPP, associated procedures, and project contractual requirements (if applicable), have been met, and if not, to determine the extent to which requirements failed to be achieved. Data verification will include the following activities, at a minimum:

- Verification that all data completeness criteria, as stated in the project QAPP, have been satisfied. This shall include items such as the number of samples, number of QC samples such as spikes and duplicates, and chain-of-custody record continuity.
- Verification that the values of individual data points, and/or comparison calculations such as RPD, meet the criteria specified in the QAPP.
- Verification that the required analytical methods, as listed in the project QAPP, correspond to the analytical methods employed by the laboratory, as recorded in laboratory reports.
- Verification that QAPP requirements relative to laboratory analytical support documentation have been satisfied by the reporting laboratory, including the correct application of data qualifiers.
- Verification that all supporting information and documentation for nondirect measurement data (existing data) meet the requirements of the QAPP. If not, identify any limitations or restriction on the use of such data.
- Verification that data and sample collection practices adhered to procedural requirements, to include a review of project logs and field notes, as applicable.
- Verification that sample handling activities conform to QAPP requirements. Examples include sample shipment timelines, sample holding times, preservatives, number of samples obtained, duplicate or split sample frequency, and chain-of-custody documentation.
- Verification that data calculation and handling activities conform to QAPP requirements. Examples include correct use of mathematical formulas and numerical methods, correct use of programs and programing, and correct application of database information transfers.
- Verification that any remaining or unique project QAPP or procedural requirements have been met, and if not, determine the extent to which these requirements failed to be achieved.
- Determine and document any limitations on the use of the project data.

**Data validation** for data and information collected under this QAPP shall be performed by the project QAO using the data validation checklist found in Appendix C. The general focus of the process is to identify if the quality of the project data meets the needs of the data user and the associated decision makers. The data validation effort for this project shall include a minimum of 10% of all project data with a goal of 20%, except as noted specifically below. Data validation will include the following activities, at a minimum:

- An evaluation and examination of all (100%) of obtained field QC sample results, such as duplicates and trip blanks, etc., followed by assignment (if necessary) of appropriate data qualifiers to these data based on project criteria.
- A review of project analytical laboratory reports and data, including the assigned data qualifiers, to evaluate the data quality with respect to the project DQOs. Assign data qualifiers to individual data values as necessary and appropriate.
- A review of the outcome of the data verification effort to evaluate the impact on data quality with respect to the DQOs.
- A determination, when necessary and where possible, of the reasons for any failure to meet methodological, procedural, or contractual requirements and an evaluation of the impact of such failure on the overall data.
- A comparison of the project DQOs, as defined in the project QAPP, to the data obtained by the project to assess the adequacy of the data (new or existing) in relation to their intended use.
- A determination of the extent to which any nondirect measurement data (existing data), and the accompanying supporting information and documentation, meet the requirements of the data user. Specifically, does the quality of the existing data adequately support the needs of the project and support the intended use of the data for the project.
- Determine and document any limitations on the use of the project data.
- Determine the adequacy of the data to proceed on to the data assessment and reconciliation with user requirements phase.

Any potentially unacceptable departures from the requirements of the project QAPP will be noted during the data review, verification, and validation process. If the project manager or the project QAO determines the data do not meet the needs of the project or the DQOs of the QAPP and/or if the conclusions drawn from the data do not appear to be reasonable, the project manager and the QAO shall immediately report such findings to the appropriate regional manager and/or State Office program manager to determine the necessary corrective actions. Documentation of such findings and activities shall be maintained in accordance with the DEQ QMP.

## **24 Reconciliation with User Requirements**

Data quality assessment (DQA) will be performed in accordance with this QAPP and the DEQ QMP (DEQ 2012a). Additional guidance for conducting data assessment can be found in EPA QA/G-9R or EPA QA/G-9S (EPA 2006a, b).

The DQA will be performed (at a minimum) by the project manager and the project QAO to determine if the project data set is of the right type, quality, and quantity to achieve the objectives of the project and can confidently be used to make an informed decision.

Information and findings associated with the project data review, verification, and validation efforts shall be considered during the data assessment process.

When DQOs are not met, the project manager will discuss appropriate corrective actions with project staff, project management, and with the analytical laboratory. Corrective actions may be initiated to suggest improvements to data collection activities, data and sample handling techniques, internal laboratory quality procedures, etc., to solve quality issues.

If the project manager or the QAO decide the project data do not meet the project needs or the QAPP quality objectives and/or if the conclusions drawn from the data do not appear to be reasonable, the project manager and the QAO shall immediately report such findings to the appropriate regional manager and/or State Office program manager to determine and document the necessary corrective actions.

If sampling activities require revision, the project QAPP and/or FSP will be revised as necessary. Following revision, and prior to implementation, the revised project QAPP and/or FSP must be re-approved in accordance with the DEQ QMP (DEQ 2012a).

## 25 References

- DEQ (Idaho Department of Environmental Quality). 2012a. *Quality Management Plan*. Boise, ID: DEQ. TRIM record number 2012AEC1. Available at <http://insidedeq.deq-intra/director/documents/quality-mgmt-plan-rev-3-2012.pdf>.
- DEQ (Idaho Department of Environmental Quality). No date (current version). "Retention Schedule." Boise, ID: DEQ. TRIM record number 2010AIC3.
- EPA (US Environmental Protection Agency). 2001. *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5). Washington DC: EPA, Office of Environmental Information. EPA/240/B-01/003. Available at <http://www.epa.gov/quality/qs-docs/r5-final.pdf>.
- EPA (US Environmental Protection Agency). 2002a. *Guidance for Quality Assurance Project Plans* (EPA QA/G-5). Washington DC: EPA, Office of Environmental Information. EPA/240/R-02/009. Available at <http://www.epa.gov/quality/qs-docs/g5-final.pdf>.
- EPA (US Environmental Protection Agency). 2002b. *Guidance on Environmental Data Verification and Data Validation* (EPA QA/G-8). Washington DC: EPA, Office of Environmental Information. EPA/240/R-02/004. Available at <http://www.epa.gov/quality/qs-docs/g8-final.pdf>.
- EPA (US Environmental Protection Agency). 2004. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (OSWER 9240.1-45). Washington DC: EPA, Office of Superfund Remediation and Technology Innovation. EPA 540-R-04-004. Available at <http://www.epa.gov/superfund/programs/clp/download/inorgfg10-08-04.pdf>.
- EPA (US Environmental Protection Agency). 2006a. *Data Quality Assessment: A Reviewer's Guide* (EPA QA/G-9R). Washington DC: EPA, Office of Environmental Information. EPA/240/B-06/002. Available at [www.epa.gov/quality/qs-docs/g9r-final.pdf](http://www.epa.gov/quality/qs-docs/g9r-final.pdf).
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- EPA (US Environmental Protection Agency). 2006c. *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA QA/G-4). Washington, DC: EPA, Office of Environmental Information. EPA/240/B-06/001. Available at <http://www.epa.gov/quality/qs-docs/g4-final.pdf>.
- EPA (US Environmental Protection Agency). 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (OSWER 9240.1-48). Washington DC: EPA, Office of Superfund Remediation and Technology Innovation. EPA 540-R-08-01. Available at <http://www.epa.gov/superfund/programs/clp/download/somnfg.pdf>.

EPA (US Environmental Protection Agency). 2009. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (OSWER No. 9200.1-85). Washington, DC: EPA, Office of Solid Waste and Emergency Response. EPA 540-R-08-005. Available at <http://www.epa.gov/superfund/policy/pdfs/EPA-540-R-08-005.pdf>.

IDWR (Idaho Department of Water Resources). January 2005. Nitrate Overview for the Statewide Ambient Ground Water Quality Monitoring Program, 1990-2003. Boise, Idaho: IDWR.

Lewis Soil Conservation District. June 2012. LSCD Final Report - Laboratory Nitrate Sampling, Analyses, and Monitoring. Nezperce, Idaho

Lower Yakima Valley Ground Water Advisory Committee. March 2014. Deep Soil Sampling Plan - Lower Yakima Valley Ground Water Management Area. Zillah, Washington.

Shoshone-Bannock Tribe. October 2014. Shoshone-Bannock Fort Hall Post-Harvest Nitrate Deep Soil Sampling Project. Fort Hall, Idaho.

## **Appendix A. Field Data Collection Forms**

Included in this appendix:

- Grower/producer Release Form
- Deep Soil Sampling Program Questionnaire
- Soil Sampling Field Form – Soil Boring Log and Soil Sample Field Log for Deep Soil Sampling Project: Marsh Creek, Minidoka and Twin Falls NPAs
- Sample Chain Of Custody Form
- Western Laboratories Agricultural Soil Submission Form

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RELEASE FORM: Deep Soil Sampling

The ISWCC has developed a procedure designed to separate your identifying information and the location of the fields being sampled from the samples and the results of the analysis. The results of the sample analysis will only be identified by the unique identifying number (UIN) that ISWCC will give only to you. ISWCC will make its best effort to ensure that identifying information is not associated with the UIN. However, ISWCC cannot guarantee the confidentiality of information collected. By signing below, you acknowledge that ISWCC has not in any way represented or guaranteed that your participation in, or any information collected through my participation in, the Post Harvest Deep Soil Sampling Project will be kept or remain confidential.

The contractor hired to conduct the soil sampling of your field(s) will work with you to identify appropriate sampling sites. As part of this process, you are responsible for providing Contractor with an accurate location of underground private utilities on the property. By signing below, you also agree to release ISWCC and Contractor from liability for any damages, losses, or expenses arising from your failure to correctly identify the location of any underground private utilities, including but not limited to irrigation mainline, electrical lines, or any other structures.

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

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## Deep Soil Sampling Program Questionnaire

### General:

As you may know, the aquifers in the Marsh Creek, Minidoka, and Twin Falls Nitrate Priority Areas have been shown to have ground water nitrate concerns. Nitrogen that has migrated below the root zone is useless to crops and can be damaging to water quality and drinking water supplies. The Idaho Soil and Water Conservation Commission (ISWCC) designed this grower survey to help everyone better understand current production methods and provide guidance to assist in improved farming practices. The correlation of the questionnaire with the Deep Soil Sampling Program is an attempt to understand the relationships between the amount and form of nitrogen applied, the application method and timing, the irrigation method, the amount of nitrogen required for plant growth based on cropping patterns, and the quantity of nitrogen that has migrated below the root zone. Participation will be anonymously structured as explained below.

ISWCC is encouraging broad producer participation in the Deep Soil Sampling Program – at no cost to the grower. Nitrogen is an expensive input and once it migrates below the root zone it becomes an expensive loss. The results of your soil samples can help guide your input decisions and potentially reduce your nutrient expenses. A grower survey has been designed to better understand current production methods and assist in improved farming practices, where they may be needed to reduce nitrates in groundwater. For those producers who, for whatever reason chose not to participate in the Deep Soil Sampling Program, ISWCC would still encourage participation through completion of the landowner survey to help us understand current production practices. This questionnaire is intended for either growers who participate in the soil sampling project and those growers who choose not to participate.

We are thanking you in advance for participating in the Marsh Creek /Minidoka/Twin Falls Deep Soil Sampling Program and for completing the questionnaire. As mentioned above, samples will be taken on your property and analyzed at no cost to you, if you participate in the soil sampling program. We are also interested in knowing your agricultural practices such as crops grown, plant nutrients applied, irrigation practices, and soil type. While information gathered in the study will be summarized in the resulting report and used in a collective manner to help describe farming operations, the report will not include specific data tied to an identifiable parcel or location.

We have developed a procedure designed to separate your identity and the location of the soil sample locations from the soil sample results and your participation on the questionnaire. You are welcome to share that information with others, but are under no obligation to do so.

If you agree to participate in the Deep Soil Sampling Program, you will be provided a Unique Identification Number (UIN) that will allow you to retrieve your soil results from the analyzing laboratory. Please keep record of your number as we will not be able retrieve your number after sampling. You can select as many qualified fields to include in the study as you feel

comfortable with and as funding allows. If you decide not to include all fields in the study, be sure to convey that information to the person collecting the samples when they arrive.

Please complete this questionnaire and return it in the envelope addressed to Carolyn Firth, ID Soil and Water Conservation Commission, 1361 East 16<sup>th</sup> St., Burley, ID 83318. Do not include your name with the return address. When the soil samples are collected, the sampler will label the sample containers with the UIN assigned to you.

When all of the samples have been collected, analyzed, and tabulated they will be posted on a website or published in a format suitable for public access. The results from your farm will be identified only by the UIN.

Participation in the Deep Soil Sampling Program can benefit you economically, as the analytical results will help determine whether or not expensive nitrogen is being applied in excess of what your crop can utilize.

Thank you for your participation.

Carolyn Firth,  
ID Soil and Water Conservation Commission,  
1361 East 16<sup>th</sup> St., Burley, ID 83318  
Office: 208 678-1225 Ext 110  
Cell: 208 810-0759

UIN:

Deep Soil Sampling Program  
Questionnaire

**WORKSHEET FOR IRRIGATED CROPLAND**

Unique Identification Number (UIN) \_\_\_\_\_ Date: \_\_\_\_\_

**Field History**

Years Owned/Leased \_\_\_\_\_ Soil Type (if known) \_\_\_\_\_

Currently Soil Testing  Yes  No If yes, how often? \_\_\_\_\_

Acres Farmed: \_\_\_\_\_

Tillage Practices for Crop Cycle

Current Crop (2017) \_\_\_\_\_

**Cropping History (Include Double Crossing)**

Crop Rotation:

2016 Crop 1 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_; Crop 2 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_

2015 Crop 1 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_; Crop 2 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_

2014 Crop 1 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_; Crop 2 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_

2013 Crop 1 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_; Crop 2 \_\_\_\_\_ Tons/Bushels/Bins/Acre \_\_\_\_

**Current method of scheduling irrigation:**

\_\_\_\_\_ ET; \_\_\_\_\_ soil moisture sensors; \_\_\_\_\_ Routine \_\_\_\_\_ hr. sets; Weather Stations \_\_\_\_\_

**Current Irrigation System:**                      **Years of use on crop?** \_\_\_\_\_

Flood Irrigation

Rill Irrigation

Solid Set above canopy -  Impact Sprinklers  Micro spray  Rotators

Solid Set below canopy -  Impact Sprinklers  Micro spray  Rotators

Wheel lines  Impact Sprinklers  Rotators

Hand lines  Impact Sprinklers  Rotators

Linear move  Impact Sprinklers  Micro spray  Rotators

Drip  tube  tape  bury line  above ground line

Pivot  Impact Sprinklers  Micro spray  Rotators

Deep Soil Sampling Program

Questionnaire

\_\_\_ Pod line \_\_\_ Impact Sprinklers \_\_\_ Rotators

\_\_\_ Other: \_\_\_\_\_

**Previous Irrigation System:**                      **Years of use on crop?** \_\_\_\_\_

\_\_\_ Flood Irrigation

\_\_\_ Rill Irrigation

\_\_\_ Solid Set above canopy - \_\_\_ Impact Sprinklers, \_\_\_ Micro spray \_\_\_ Rotators

\_\_\_ Solid Set below canopy - \_\_\_ Impact Sprinklers, \_\_\_ Micro spray \_\_\_ Rotators

\_\_\_ Wheel lines \_\_\_ Impact Sprinklers \_\_\_ Rotators

\_\_\_ Hand lines \_\_\_ Impact Sprinklers \_\_\_ Rotators

\_\_\_ Linear move \_\_\_ Impact Sprinklers, \_\_\_ Micro spray \_\_\_ Rotators

\_\_\_ Drip \_\_\_ tube, \_\_\_ tape, \_\_\_ bury line \_\_\_ above ground line

\_\_\_ Pivot \_\_\_ Impact Sprinklers, \_\_\_ Micro spray \_\_\_ Rotators

\_\_\_ Pod line \_\_\_ Impact Sprinklers \_\_\_ Rotators

\_\_\_ Other: \_\_\_\_\_

**Nitrogen applications**

**Manure - Liquid**

Year	Gallons/Acre applied	#N/1000 gal	How applied	Hours to incorporation	notes
2016					
2015					
2014					
2013					

**Manure - Solid**

Year	Tons/Acre applied	#N/ton	How applied	Hours to incorporation	notes
2016					
2015					
2014					
2013					

**Commercial Fertilizer**

Year	Material type?	#N/Acre applied	How applied	Hours to incorporation	notes
2016					
2015					

Deep Soil Sampling Program  
 Questionnaire

2014					
2013					

Biosolids

Year	Tons/Acre applied	#N/ton	How applied	Hours to incorporation	notes
2016					
2015					
2014					
2013					

Compost

Year	Tons/Acre applied	#N/ton	How applied	Hours to incorporation	notes
2016					
2015					
2014					
2013					

Other

Year	Tons applied	#/ton	How applied	Hours to incorporation	notes
2016					
2015					
2014					
2013					

Please provide additional information if appropriate such as split applications, starter, side dress, etc.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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Soil Boring Log and Soil Sample Field Form for Deep Soil Sampling Project: Marsh Creek, Minidoka, and Twin Falls Nitrate Priority Areas

Return this form, filled out, to Idaho Soil & Water Conservation Commission, 1361 E. 16th St. Burley, ID 83318. Or form may be emailed to Carolyn.Firth@swc.idaho.gov

Unique Identification Number (UIN): \_\_\_\_\_

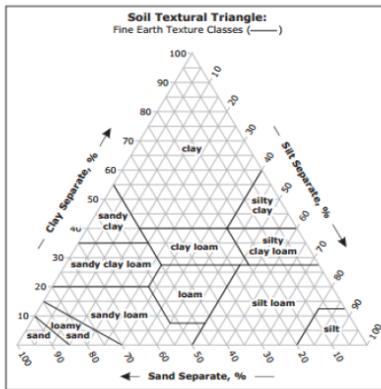
Boring Date: \_\_\_\_\_ Boring Logged by: \_\_\_\_\_

Boring and Sampling Device (example: AMS 9100 Ag Probe with 2-inch tube sampler) \_\_\_\_\_

NRCS Soil Series (soil type) \_\_\_\_\_

Describe each composite soil sample.

Depth in ft	Munsell color	Consistence	Moisture	Texture	Other
0-1					
1-2					
2-3					
3-4					
4-5					
5-6					
6-7					
7-8					



**TEXTURE MODIFIERS** - Conventions for using "Rock Fragment Texture Modifiers" and for using textural adjectives that convey the "% volume" ranges for **Rock Fragments - Size and Quantity**.

Fragment Content % by Volume	Rock Fragment Modifier Usage
< 15	No texture adjective is used (noun only; e.g., loam).
15 to < 35	Use adjective for appropriate size; e.g., gravelly.
35 to < 60	Use "very" with the appropriate size adjective; e.g., very gravelly.
60 to < 90	Use "extremely" with the appropriate size adjective; e.g., extremely gravelly.

Moisture options: D=dry  
 M=moist  
 Dp=damp  
 W=wet

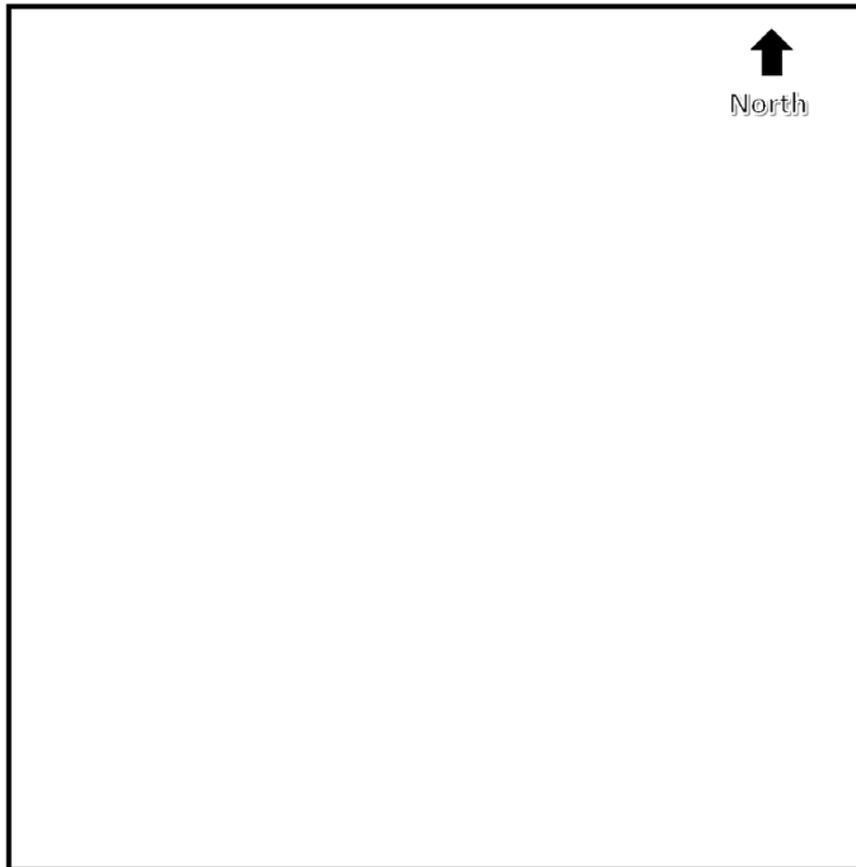
Consistence options:  
 L=loose, S=soft, SH=slightly hard, HA=hard, EH=extremely hard, FR=friable, FI=firm; VFI=very firm; C=cemented.  
 See Field Book for Describing and Sampling Soils, NRCS, August 2011.

Soil Boring Log and Soil Sample Field Form for Deep Soil Sampling Project: Marsh  
Creek, Minidoka, and Twin Falls Nitrate Priority Areas

Unique Identification Number (UIN):

Sampling Site Sketch:

Draw sampling site and borings in relation to irrigation system and other features.



Record any other relevant information here:



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# WESTERN LABORATORIES, INC.

P.O. Box 1020 • 211 Highway 95 (UPS and FedEx) • Parma, Idaho 83660  
 800-656-3858 • Fax 208-722-5550 • john@westernlaboratories.com

## Agricultural Soil Submission Form

Please download this file, use the tab-key to fill out the info and submit this sheet with your samples

Dealer		Crop Advisor				
Email Address						
Grower Name						
Billing Address						
City		State		Zip Code		
Telephone Number			Cell Number			
Field ID	Test #	Acres	Crop 1	Yield Goal 1	Yield Goal 2	Past Crop

*Please write your Field Identification on each sample bag and include this form with your samples. Keep a copy for your records as well.*

Sample collected by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
------------------	------	------	--------------	------------------	------	------	--------------

Chain of custody information

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## **Appendix B. Nitrate Priority Area Maps and County FIPS Codes**

Included in this appendix:

- Figure B1 - Marsh Creek and Minidoka NPA, Cassia and Minidoka Counties
- Figure B2 - Twin Falls NPA and source water delineations, Twin Falls County
- Table B1 – Idaho County FIPS codes

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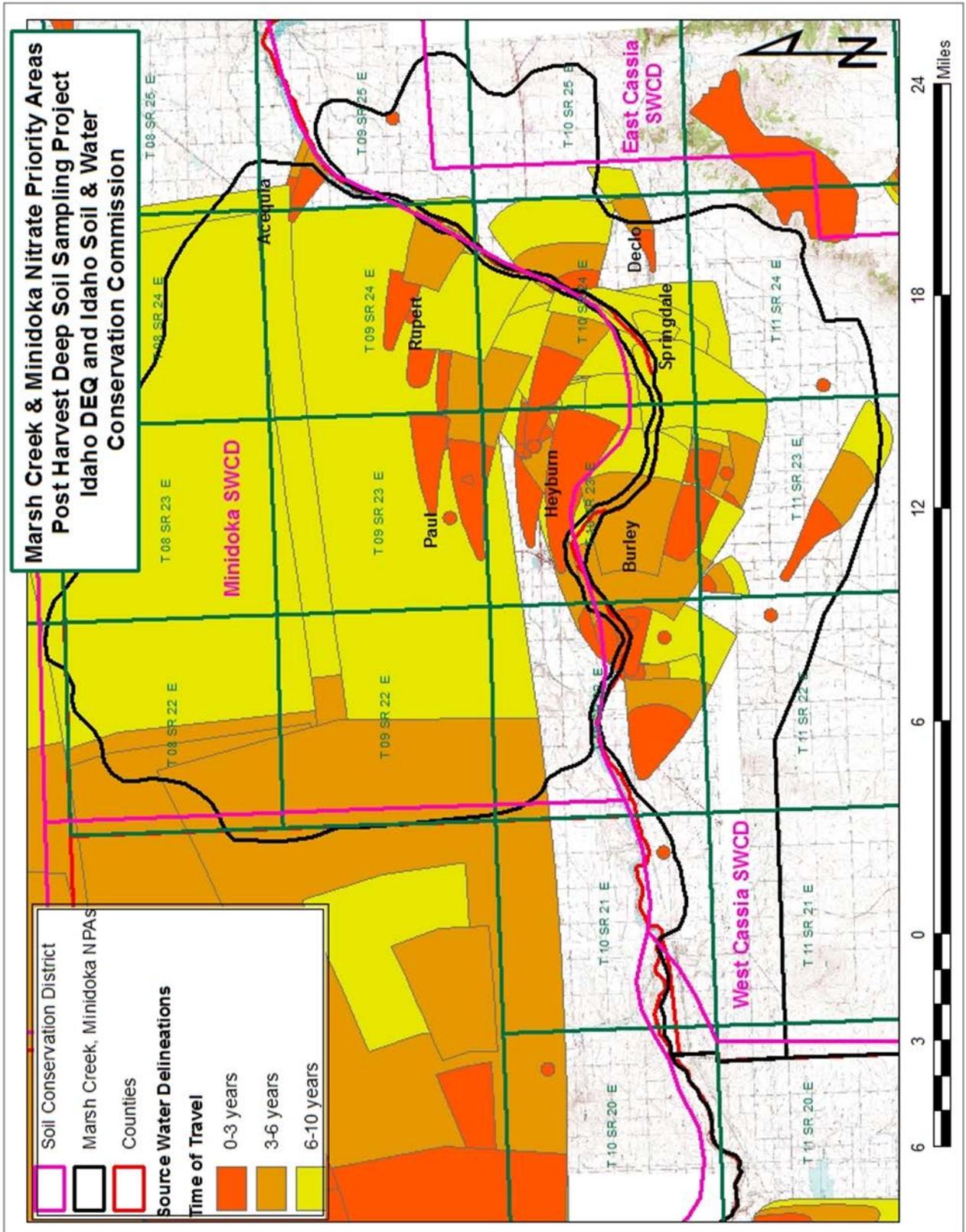


Figure B 1 Marsh Creek and Minidoka NPAs, Cassia and Minidoka Counties.

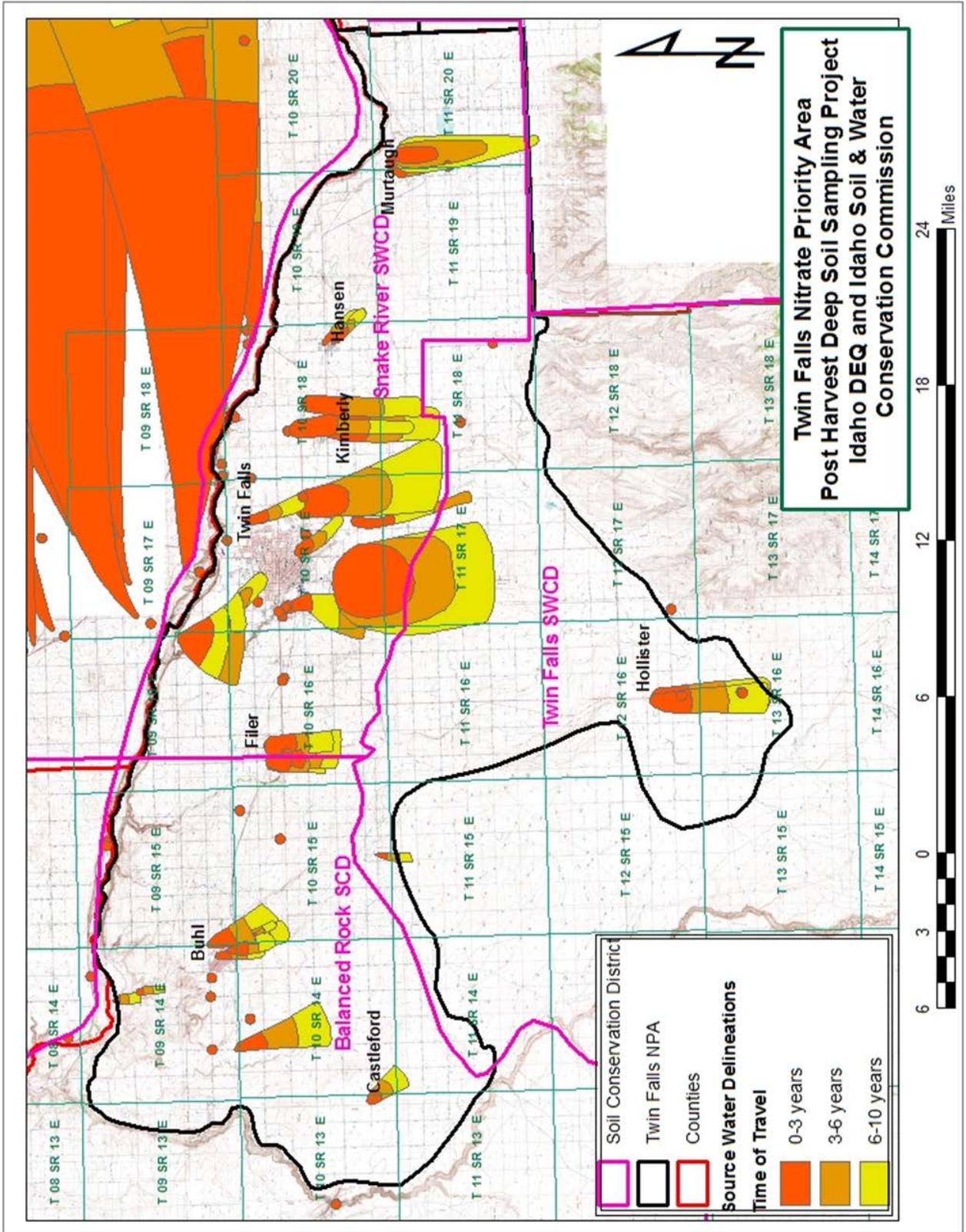


Figure B 2 Twin Falls NPA, Twin Falls County.

Table B1. Idaho County FIPS Codes

County	Count Code	County	Count Code
Ada	1	Gem	45
Adams	3	Gooding	47
Bannock	5	Idaho	49
Bear Lake	7	Jefferson	51
Benewah	9	Jerome	53
Bingham	11	Kootenai	55
Blaine	13	Latah	57
Boise	15	Lemhi	59
Bonner	17	Lewis	61
Bonneville	19	Lincoln	63
Boundary	21	Madison	65
Butte	23	Minidoka	67
Camas	25	Nez Perce	69
Canyon	27	Oneida	71
Caribou	29	Owyhee	73
Cassia	31	Payette	75
Clark	33	Power	77
Clearwater	35	Shoshone	79
Custer	37	Teton	81
Elmore	39	Twin Falls	83
Franklin	41	Valley	85
Fremont	43	Washington	87

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## Appendix C. Project Checklists

All checklists in this appendix are available for download and use by project staff as standalone electronic documents, from either the DEQ TRIM system or the DEQ Quality System website: <http://insidedeq.deq-intra/director/quality.htm>.

Prior to using an activity checklist, project staff should review the applicable requirements listed in the project QAPP and the QMP.

The following checklists are included in this appendix:

- Data Review—TRIM record #2012AEB2
- Data Verification—TRIM record #2012AEB3
- Data Validation—TRIM record #2012AEB4
- Project QAO Annual Audit—TRIM record #2012AEB5

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## DEQ QAPP/FSP Checklist—Data Review

The individual assigned in the project QAPP/FSP to perform project **data review** *shall complete and file this checklist in the appropriate project TRIM system files*. Project personnel are encouraged to expand this standard list, as project conditions warrant.

Printed Name of Staff Performing Data Review	Date Completed
Deep Soil Sampling Project: Marsh Creek, Minidoka, TF NPA	2017AIL31
Project QAPP/FSP Title	QAPP/FSP TRIM Record #

**Check the following review boxes following completion of each listed task.**

**Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Verify that the approved current project QAPP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the QAPP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.

\_\_\_\_\_  
\_\_\_\_\_

- If the project utilizes an FSP, verify that the approved project FSP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the FSP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.

\_\_\_\_\_  
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- Examination and review the project QAPP (and FSP, if used) to determine if additional project-specific data *review* requirements apply. Update this checklist to include all such items.

\_\_\_\_\_  
\_\_\_\_\_

- Examine project data, identifying errors in data entry, storage, calculation, reduction, transformation, or transcription.

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Yes No

Ensure all required sample information is documented and available, in preparation for the verification, validation, and assessment process. This includes pertinent project information concerning blanks, matrixes, temperature requirements, duplicates, preservatives, shipping dates, holding times, chain-of-custody records, etc.

\_\_\_\_\_  
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Identify if all required nondirect measurement data (existing data) information *and supporting documentation*, as required by the project QAPP (and FSP, if used), have been received and are available for the verification and validation process.

\_\_\_\_\_  
 \_\_\_\_\_

Determine if any data deficiencies exist, such as missing data or compromised data integrity, due to issues such as loss in acquisition, storage, or processing.

\_\_\_\_\_  
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Ensure all necessary analytical laboratory support documentation, as set forth and stipulated in the project QAPP (and FSP, if used), have been received from the applicable laboratories.

\_\_\_\_\_  
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Identify programming and/or software related errors, if applicable to the project.

\_\_\_\_\_  
 \_\_\_\_\_

Ensure that all deficiencies and/or conditions adverse to quality determined during the project data *review* process have been communicated to project management and are listed on this checklist or attached for inclusion in the TRIM record system.

\_\_\_\_\_  
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Verify that a copy of this data review checklist has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional data review actions may be required based on the checklist findings, such as a corrective action plan/reports, etc. The project manager shall consult the DEQ QMP and proceed accordingly.

\_\_\_\_\_  
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Please list any additional comments below. Attach additional sheets as necessary.

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## DEQ QAPP/FSP Checklist—Data Verification

The individual assigned in the project QAPP/FSP to perform project **data verification** *shall complete and file this checklist in the appropriate project TRIM system files*. Project personnel are encouraged to expand this standard list, as project conditions warrant.

Printed Name of Staff Performing Data Verification	Date Completed
Deep Soil Sampling Project: Marsh Creek, Minidoka, TF NPA	2017AIL31
Project QAPP/FSP Title	QAPP/FSP TRIM Record #

**Check the following review boxes following completion of each listed task.**

**Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Examine and review the project QAPP (and FSP, if used) to determine if additional project specific data *verification* requirements apply. Update this checklist to include all such items.

\_\_\_\_\_  
 \_\_\_\_\_

- Verify that all data completeness criteria, as stated in the project QAPP (and FSP, if used), have been satisfied. This shall include items such as the number of samples, number of QC samples such as spikes and duplicates, and chain-of-custody record continuity.

\_\_\_\_\_  
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- Verify that the values of individual data points, and/or comparison calculations such as RPD, meet the criteria specified in the QAPP (and FSP, if used).

\_\_\_\_\_  
 \_\_\_\_\_

- Verify that the required analytical methods, as listed in the project QAPP (and FSP, if used) correspond to the analytical methods employed by the laboratory, as recorded in laboratory reports.

\_\_\_\_\_  
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- Verify that QAPP (and FSP, if used) requirements relative to laboratory analytical support documentation have been satisfied by the reporting laboratory, including the correct application of data qualifiers.

\_\_\_\_\_  
 \_\_\_\_\_

- Verify that all supporting information and documentation for nondirect measurement data (existing data) meet the requirements of the QAPP (and FSP, if used). If not, identify any limitations or restriction on the use of such data.

\_\_\_\_\_  
 \_\_\_\_\_

Yes No

- Verify that data and sample collection practices adhered to procedural requirements, to include a review of project logs and field notes, as applicable.
 

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- Verify that sample handling activities conform to QAPP (and FSP, if used) requirements. Examples include sample shipment timelines, sample holding times, preservatives, number of samples obtained, duplicate or split sample frequency, and chain-of-custody documentation.
 

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- Verify that data calculation and handling activities conform to QAPP (and FSP, if used) requirements. Examples include correct use of mathematical formulas and numerical methods, correct use of programs and programing, and correct application of database information transfers.
 

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- Verify that any remaining or unique project QAPP (and FSP, if used) or procedural requirements have been met, and if not, determine the extent to which these requirements failed to be achieved.
 

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- Determine and document any limitations on the use of the project data.
 

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- Ensure that all deficiencies and/or conditions adverse to quality determined during the project data *verification* process have been communicated to project management and are listed on this checklist or attached for inclusion in the TRIM record system.
 

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- Verify that a copy of this data verification checklist has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional data verification actions may be required based on the checklist findings, such as a corrective action plan/reports, etc. The project QAO shall consult the DEQ QMP and proceed accordingly.
 

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Please list any additional comments below. Attach additional sheets as necessary.

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## DEQ QAPP/FSP Checklist—Data Validation

The individual assigned in the project QAPP/FSP to perform project **data validation** shall complete and file this checklist in the appropriate project TRIM system files. Project personnel are encouraged to expand this standard list as project conditions warrant.

Printed Name of Staff Performing Data Validation	Date Completed
Deep Soil Sampling Project: Marsh Creek, Minidoka, TF NPA Project QAPP/FSP Title	2017AIL31 QAPP/FSP TRIM Record #

**Check the following review boxes following completion of each listed task.**

**Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Verify that the approved current project QAPP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the QAPP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.
   


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- If the project utilizes a FSP, verify that the approved project FSP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the FSP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.
   


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- Examine and review the project QAPP (and FSP, if used) to determine if additional project-specific data *validation* requirements apply. Update this checklist to include all such items.
   


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- Evaluate and examine all (100%) of obtained field QC sample results, such as duplicates and trip blanks, etc., followed by assignment (if necessary) of appropriate data qualifiers to these data based on project criteria.
   


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- Review project analytical laboratory reports and data, including the assigned data qualifiers, to evaluate the data quality with respect to the project DQOs. Assign data qualifiers to individual data values as necessary and appropriate.
   


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Yes No

- Review the outcome of the data verification effort to evaluate the impact on data quality with respect to the DQOs.

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- Determine, when necessary and where possible, the reasons for any failure to meet methodological, procedural, or contractual requirements and evaluate the impact of such failure on the overall data.

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- Compare the project DQOs, as defined in the project QAPP (and FSP, if used), to the data obtained by the project to assess the adequacy of the data (new or existing) in relation to their intended use.

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- Determine the extent to which any nondirect measurement data (existing data), and the accompanying supporting information and documentation, meet the requirements of the data user. Specifically, does the quality of the existing data adequately support the needs of the project and support the intended use of the data for the project?

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- Determine and document any limitations on the use of the project data.

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- Determine the adequacy of the data to proceed on to the data assessment and reconciliation with user requirements phase.

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- Ensure that all deficiencies and/or conditions adverse to quality determined during the project data *validation* process have been communicated to project management and are listed on this checklist or attached for inclusion in the TRIM record system.

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- Verify that a copy of this data validation checklist has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional data validation actions may be required based on the checklist findings, such as a corrective action plan/reports, etc. The project QAO shall consult the DEQ QMP and proceed accordingly.

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Please list any additional comments below. Attach additional sheets as necessary.

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## DEQ QAPP/FSP Checklist—Annual QAO Project Audit

The individual assigned in the project QAPP/FSP as the project quality assurance officer (QAO) shall audit the project on at least an annual basis. The QAO *shall complete this checklist as part of the audit process and file the completed form in the appropriate project TRIM system files.* Project QAOs are encouraged to expand this standard list as project conditions warrant.

\_\_\_\_\_  
Printed Name of Staff Performing the QAO Audit

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Deep Soil Sampling Project: Marsh Creek, Minidoka, TF NPA

\_\_\_\_\_  
2017AIL31

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Project QAPP/FSP Title

\_\_\_\_\_  
QAPP/FSP TRIM Record #

**Check the following review boxes following completion of each listed task.**

**Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Verify that the approved current project QAPP (and FSP, if used), including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information for the QAPP (and FSP, if used) has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the QAPP (and FSP, if used) are not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Verify that the approved and current project documents, such as the project QAPP (and FSP, if used), SOPs, etc., are available to project staff and are in use per project requirements.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Determine through review and observation if the project has performed and documented project activities as described and required by the project QAPP (and FSP, if used) such that the needs of the data user are satisfied.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Determine if the project QAPP (and FSP, if used) adequately document and describe the actual project requirements such that the needs of the data user are satisfied. If necessary, in coordination with the project manager, initiate project document revision, review, and approval efforts in accordance with the DEQ QMP.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Determine if the project analytical requirements are adequately met by the selected laboratory, including use of proper analytical methods and sufficient analytical data support documentation.
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Yes No

- Determine if project sample handling activities are in compliance with the requirements of the project QAPP (and FSP, if used).

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- Determine if project field activities are in compliance with the requirements of the project QAPP (and FSP, if used).

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- Determine if all nondirect data acquisition associated with the project has been addressed and properly documented in the project QAPP (and FSP, if used).

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- Compare actual project documents available in the DEQ TRIM record system against the document filing requirements contained in the project QAPP (and FSP, if used). Identify existing deficiencies in the project TRIM system files, such as missing field note pages and missing chain-of-custody forms, and provide this information to the project manager for immediate resolution.

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- Ensure that all deficiencies and/or conditions adverse to quality determined during the project QAO audit process are listed on this checklist or attached for inclusion in the TRIM record system.

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- Verify that a copy of this annual QAO audit report has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional audit administrative actions may be required based on audit findings, such as a corrective action plan/reports, etc. The project QAO shall consult the DEQ QMP and proceed accordingly.

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Please list any additional comments below. Attach additional sheets as necessary.

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## **Appendix D. Procedures**

The following Procedures are included in this appendix:

- University of Idaho College of Agriculture Soil Sampling - Bulletin 704

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# Soil Sampling

Bulletin 704  
(revised)

R. L. Mahler and  
T. A. Tindall



*College of  
Agriculture*

 University of Idaho  
Cooperative Extension System

# Soil Sampling



Environmental concerns have brought nutrient management in agriculture under increased scrutiny. A goal of sound nutrient management is to maximize the proportion of applied nutrients that is used by the crop (nutrient use efficiency). Soil sampling is a best management practice (BMP) for fertilizer management that will help improve nutrient use efficiency and protect the environment.

Soil sampling is also one of the most important steps in a sound crop fertilization program. Poor soil sampling procedures account for more than 90 percent of all errors in fertilizer recommendations based on soil tests. Soil test results are only as good as the soil sample. Once you take a good sample, you must also handle it properly for it to remain a good sample.

A good soil testing program can be divided into four operations: (1) taking the sample, (2) analyzing the sample, (3) interpreting the sample analyses, and (4) making the fertilizer recommendations. This publication focuses on the first step, collecting the soil sample.

Once you take a sample, you must send it to a laboratory for analysis. Then the Extension agricultural educator or fertilizer fieldman in your county can interpret the analysis and make specific fertilizer recommendations. Fertilizer guides from the University of Idaho Cooperative Extension System are also available to help you select the correct fertilizer application rate.

*The soil sampling guidelines in this publication meet sampling standards suggested by federal, state, and local nutrient management programs in Idaho.*

## What is a soil test?

A soil test is a chemical evaluation of the nutrient-supplying capability of a soil at the time of sampling. Not all soil-testing methods are alike nor are all fertilizer recommendations based on those soil tests equally reliable.

Reliable fertilizer recommendations are developed through research by calibrating laboratory soil test values and correlating them with crop responses to fertilizer rates. These soil test correlation trials must be conducted for several years on a particular crop growing on a specific soil type. If soil test calibration is incomplete, fertilizer recommendations based on soil-test results still can only be best guesses.

A soil test does not measure the total amount of a specific nutrient in the soil. There is usually little relationship between the total amount of a nutrient in the soil and the amount of a nutrient that plants can obtain.

A soil test also does not measure the amount of plant-available nutrients in the soil because not all the nutrients in the soil are in a form readily usable by plants. Through research, however, a relationship can usually be established between soil test nutrient levels and the total amount of a nutrient in the soil.

## What does a soil test measure?

Present soil-testing methods measure a certain portion of the total nutrient content of the soil. During testing, this portion is removed from the soil by an extracting solution that is mixed with the soil for a given length of time. The solution containing the extracted portion of the nutrient is separated from the soil by filtration, and then the solution is analyzed.

A low soil-test value for a particular nutrient means the crop will be unable to obtain enough of that nutrient from the soil to produce the highest yield under average soil and climatic conditions. A nutrient deficiency should be corrected by adding the nutrient as a fertilizer. The amount of nutrient that needs to be added for a given soil-test value is calculated based on results from the correlation research test plots.

## Sampling timing

Because nutrient concentrations in the soil vary with the season, you should take soil samples as close as possible to planting or to the time of crop need for the nutrient. Ideally, take the soil samples 2 to 4 weeks before planting or fertilizing the crop. It usually requires 1 to 3 weeks to take a soil sample, get the sample to the testing laboratory, and obtain results.

Sampling very wet, very dry, or frozen soils will not affect soil test results

though collecting soil samples under these conditions is difficult. Do not sample snow-covered fields. The snow makes it difficult to recognize and avoid unusual areas in the field, so you may not get a representative sample.

### Sampling frequency

For best soil fertility management, especially for the mobile nutrients, sample each year and fertilize for the potential yield of the intended crop. Having an analysis performed for every nutrient each year is not necessary. Whether you need an analysis of a nutrient depends on such things as its mobility in the soil and the nutrient requirements of the crop.

Take soil samples at least once during each crop rotation cycle. Maintain a

record of soil test results on each field to evaluate long-term trends in nutrient levels.

### Sampling procedure

One of the most important steps in a soil testing program is to collect a soil sample that represents the area to be fertilized. If the soil sample is not representative, the test results and recommendations can be misleading.

The correct steps in soil sampling are illustrated in figure 1. Before sampling, obtain necessary information, materials, and equipment from the Extension agricultural educator or fertilizer fieldman in your county.

Use proper soil sampling tools. A soil auger or probe is most convenient, but

you can use a shovel or spade for shallow samples. You will need a plastic bucket or other container for each sample to help you collect and mix a composite sample.

Be sure that all equipment is clean, and especially be sure it is free of fertilizer. Even a small amount of fertilizer dust can result in a highly erroneous analysis. Do not use a galvanized bucket when analyzing for zinc (Zn) or a rusty shovel or bucket when analyzing for iron (Fe). If the sample will be analyzed for Fe or manganese (Mn), do not dry the soil sample before shipping.

When sampling, avoid unusual areas such as eroded sections, dead furrows, and fence lines. If the field to be sampled covers a large area with

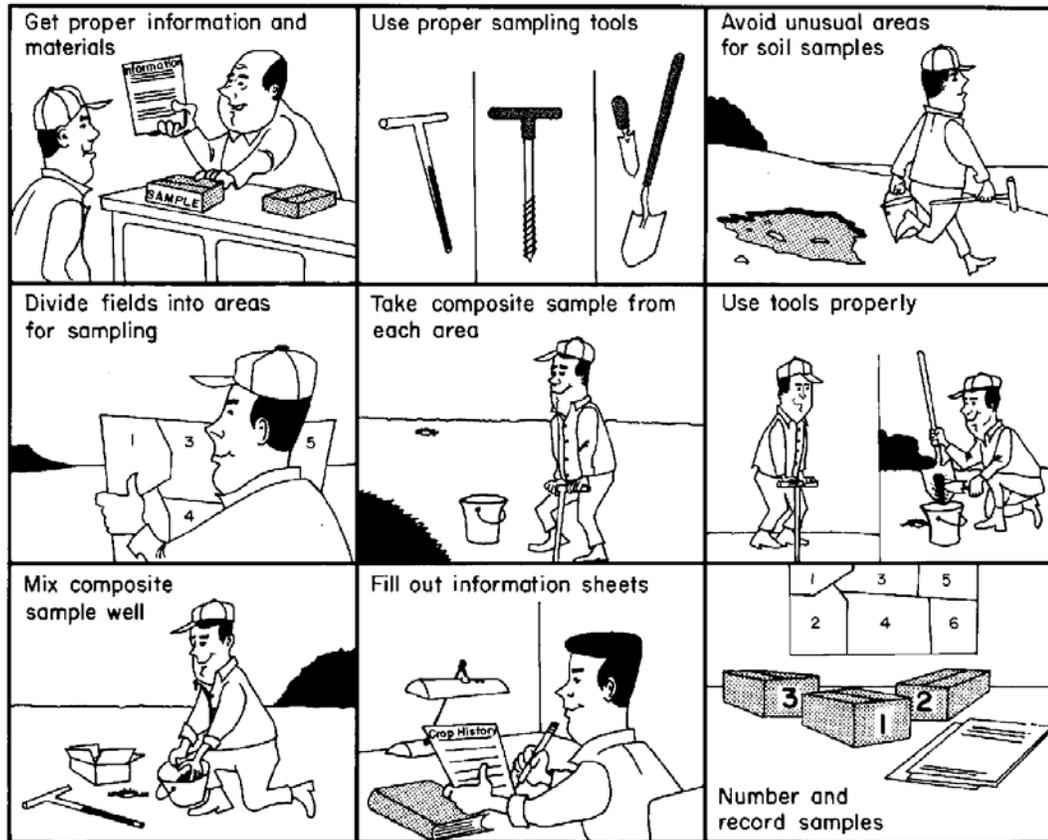


Fig. 1. Follow these steps to obtain a good sample for testing (redrawn courtesy of the National Fertilizer Institute).

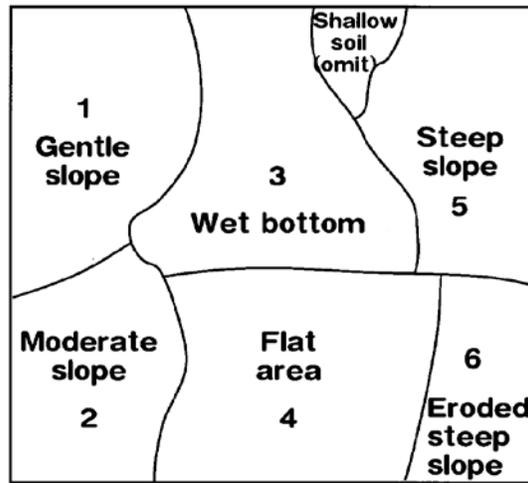


Fig. 2. A field with areas identified as sampling units.

varied topography, subdivide it into relatively uniform sampling units (fig. 2). Sampling subdivision units that are too small to fertilize separately may be of interest, but impractical if you do not treat the small units differently from the rest of the field. Omit these areas from the sampling.

Within each sampling unit take soil samples from several different locations and mix these subsamples into one composite sample. The number of subsamples needed to obtain a representative composite sample depends on the uniformity and size of the sampling unit (table 1). Although the numbers of subsamples in table 1 give the best results, they may be unrealistic if you plan to take a great number of samples. An absolute minimum of 10 subsamples from each sampling unit is necessary to obtain an

Table 1. Number of subsamples recommended for a representative composite sample based on field size.

Field size (acres)	Number of subsamples
fewer than 5	15
5 to 10	18
10 to 25	20
25 to 50	25
more than 50	30

acceptable sample. The more subsamples you take, the better the representation of the area sampled.

Take all subsamples randomly from the sampling unit, but be sure to distribute subsample sites throughout the sampling unit. Meander or zig-zag throughout each sampling unit to sample the area. Special considerations are necessary in eroded areas, furrow irrigation, under no-till, and where fertilizer is banded (see "Special Sampling").

The total amount of soil you collect from the sampling unit may be more

Table 2. Effective rooting depth for some common Idaho crops.

Crop	Depth (feet)
Cereals (wheat, barley, oats)	5 to 6
Corn	5 to 6
Alfalfa, rapeseed	4 to 5
Hops, grapes, tree fruits	4 to 5
Sugarbeets	2 to 3
Peas, beans, lentils, onions, potatoes, mint	2
Vegetable seed	1 to 1½

than you need for analyses. Mix the individual subsamples together thoroughly and take the soil sample from the composite mixture. The composite sample should be at least 1 pint—about 1 pound—in size.

### Sampling depth

Depth of sampling is critical because tillage and nutrient mobility in the soil can greatly influence nutrient levels in different soil zones (fig. 3). Sampling depth depends on the crop, cultural practices, tillage depth, and the nutrients to be analyzed.

Because the greatest abundance of plant roots, greatest biological activity,

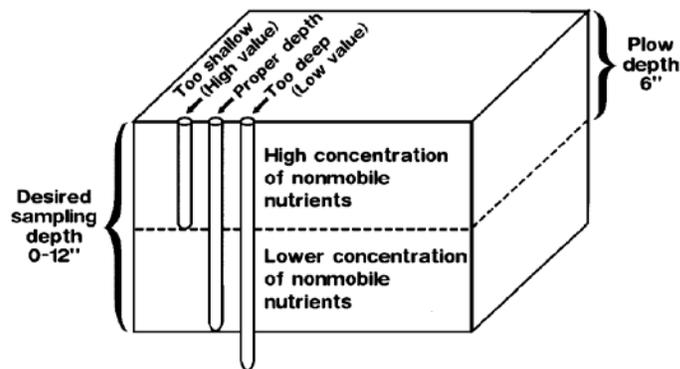


Fig. 3. Too deep or shallow a sampling depth can produce inaccurate soil test results. The plow layer is usually higher in nonmobile nutrients than the soil layers below it.

and highest nutrient levels occur in the surface layers, the upper 12 inches of soil are used for most analyses. The analyses run on the surface sample include soil reaction (pH), phosphorus (P), potassium (K), organic matter, sulfur (S), boron (B), zinc (Zn), and other micronutrients.

Sampling depth is especially critical for nonmobile nutrients such as P and K. The recommended sampling depth for nonmobile nutrients is 12 inches (fig. 3).

The tillage zone, typically 6 to 8 inches deep, usually contains a relatively uniform, high concentration of nonmobile nutrients. Below the tillage zone the concentration is usually lower. Therefore, a sample from the tillage zone will usually have a higher content of nonmobile

nutrients than a sample from the desired 0- to 12-inch sample depth. This can lead to erroneous results.

### Depth sampling

When sampling for mobile nutrients such as nitrogen (N), boron (B), and sulfur (S), take samples by 1-foot increments to the effective rooting depth of the crop (fig. 4). This can be a depth of 5 to 6 feet (table 2) unless the soil has a root-limiting layer such as bedrock or hardpan. For each foot depth, take 10 or more subsamples at random from the sampling unit.

If you plan to sample less than a year after banding or injecting fertilizer or if you have any question about fertilizer placement, use the sampling technique described under "Areas

Where Fertilizer Has Been Banded." Irrigation or precipitation should disperse mobile nutrients over a period of a year.

### Sample handling

Soil samples need special handling to ensure accurate results and minimize changes in nutrient levels because of biological activity. Keep moist soil

samples cool at all times during and after sampling. Samples can be frozen or refrigerated for extended periods of time without adverse effects.

If the samples cannot be refrigerated or frozen soon after collection, air dry them or take them directly to the soil testing laboratory. Air dry by spreading the sample in a thin layer on a plastic sheet. Break up all clods or lumps, and spread the soil in a layer about 1/4 inch deep. Dry at room temperature. If a circulating fan is available, position it to move the air over the sample for rapid drying.

**Caution:** Do not dry where agricultural chemical or fertilizer fumes or dust will come in contact with the samples. Do not use artificial heat in drying. Ask the Extension agricultural educator or fertilizer fieldman in your county for more details concerning special handling of soil samples.

When the soil samples are dry, mix the soil thoroughly, crushing any coarse lumps. Take from the sample about 1 pint (roughly 1 pound) of well-mixed soil and place it in a soil sample bag or other container. Soil sample bags and soil test report forms are available from the Cooperative Extension System office in your county or from a fertilizer fieldman.

Label the bag carefully with your name, the sample number, sample depth, and field number. The field number should correspond with a field or farm map showing the areas

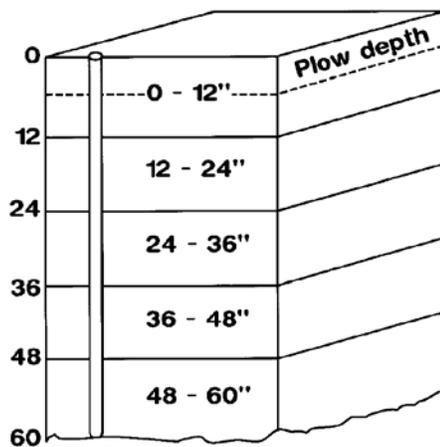


Fig. 4. Depth sampling (successive samples by 12-inch increments) for mobile nutrients (especially N) should be continued to rooting depth, which may be 5 to 6 feet for some crops.

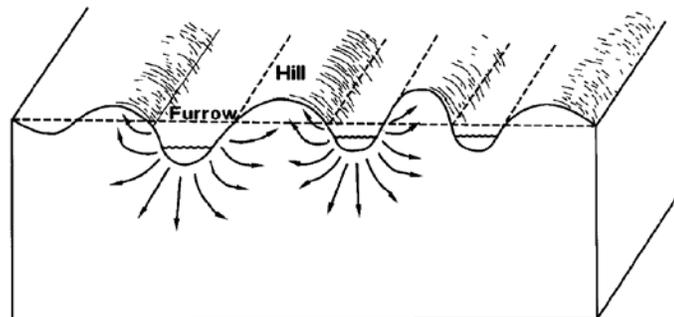


Fig. 5. Movement of mobile nutrients in furrow-irrigated fields.

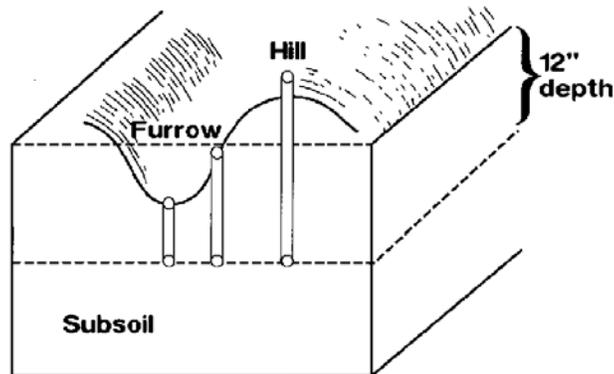


Fig. 6. Special sampling techniques are required when soil sampling furrow-irrigated fields. Take a sample from the hilltop, the furrow bottom, and at the midpoint between the hilltop and furrow bottom. The 12-inch sampling depth is based on the midpoint sampling location.

sampled. This will help you keep an accurate record of soil test reports. Provide information on crop to be grown, yield potential, recent history of crops grown, yields, fertilizer applied, and other information.

### Sample analysis

Analyze regularly only for those nutrients that have been shown to be yield limiting in your area or for the crop to be grown. In general, all soils should be analyzed for N, P, K, and S. For determination of potential need for micronutrients, refer to PNW 276, *Current Nutrient Status of Soils in Idaho, Oregon, and Washington*. Occasional analyses for micronutrient concentrations may be advisable.

### Special sampling

Special sampling problems occur in fields that have been leveled for irrigation, fields that have lost all or most topsoil as a result of erosion, fields that are surface (furrow)

irrigated, fields that have had a fertilizer band applied, and fields that are not thoroughly tilled.

### Land-leveled and eroded areas

Areas that have been eroded or artificially leveled for irrigation usually have little or no original topsoil. The soil surface may be exposed subsoil material. These areas should be sampled separately if they are large enough to be managed differently from where topsoil has not been removed. Subsoil material is usually low in organic matter and can be high in clay, calcium carbonate (lime), or both.

### Furrow-irrigated fields

For a representative soil sample, sample furrow-irrigated fields before the furrowing operation. If furrowing has already been completed, follow the special sampling procedures described here.

The movement of water and dissolved plant nutrients can create unique nutrient distribution patterns in the hills between the furrows (fig. 5). To obtain a representative sample, you need to be aware of furrow direction, spacing, and location, and to take closely spaced soil samples perpendicular to the furrow (fig. 6).

Approximately 20 sites (with at least three samples per site) are needed for a representative composite soil sample. At each sampling site, take a sample from the hilltop, from the midpoint between the hilltop and furrow, and from the furrow bottom. The sampling depth at the midpoint between the hilltop and furrow bottom should be 12 inches. The bottom point of this sample should be the same as for the furrow and hilltop samples. Thus, the furrow sampling depth will be less than 12 inches, while the hilltop sampling depth will be more than 12 inches (fig. 6).

Mix the hilltop, midpoint, and furrow samples to make a composite sample for each site. Mix the site samples for a representative composite field soil

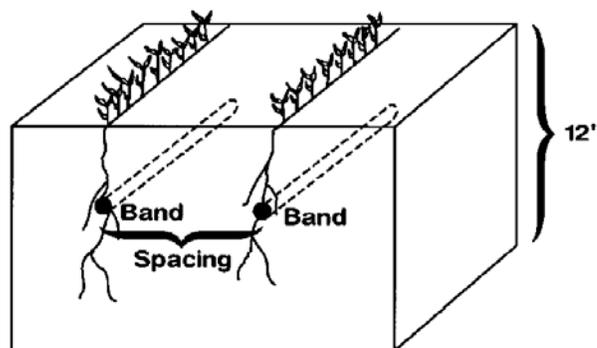


Fig. 7. Diagram of fertilizer location in soil where fertilizer has been banded.

sample to be analyzed for nonmobile nutrients (P, K, and micronutrients). Deeper profile sampling (depth sampling) is recommended for mobile nutrients (N and S).

### *Areas where fertilizer has been banded*

Banding of fertilizers is becoming a more common practice (fig. 7). In fields where fertilizers have been banded and tillage has occurred before soil sampling, regular sampling procedures can be followed. However, if tillage has not adequately mixed the soil, special soil sampling is required. If a field has had a banded fertilizer application the previous growing season and has not been plowed, an ideal sample would be a continuous slice 1 to 2 inches thick and 12 inches deep extending from the center of one band to the center of the next band.

Little research has been conducted to determine the best method of sampling banded fields. Currently three different approaches are used widely. Each method produces a satisfactory representative sample, but the effort required to obtain these samples differs considerably.

**Systematic sampling method** . If you know the direction, depth, and spacing of the fertilizer band, you can obtain a representative soil sample with this sampling procedure. Take 5 to 10 soil samples perpendicular to the band row beginning in the edge of a fertilizer band and ending at the edge of an adjacent band (fig. 8). Follow this procedure on at least 20 sampling sites in each field or portion of a field being sampled. Mix and composite the soils collected from each site to obtain a representative soil sample.

**Controlled sampling method.** You also should know the direction, depth, and spacing of the fertilizer bands to obtain a representative soil sample with this method. Take 20 to 30 soil cores from locations scattered throughout the field or portion of the field. Avoid sampling directly in a fertilizer band.

The composite sample should adequately represent the area being sampled. This method may result in slightly lower soil test values of nonmobile nutrients (P, K, and micronutrients) than the systematic and random sampling methods.

**Random sampling method** . Use this sampling method when the location of the previous season's fertilizer bands is not known. Take 40 to 60 random soil cores to form a composite sample of the area being sampled.

### *Reduced tillage or no-till fields*

You may need special approaches to soil sampling with reduced tillage or no-till fields because the soil has been disturbed so little that fertilizer, whether broadcast on the surface or banded below the surface, is not mixed into the soil. You need to know the history of fertilization, tillage, and other management practices to determine how to obtain a representative sample.

If nonmobile nutrients (P, K, and micronutrients other than B) have been surface broadcast and little or no tillage has been used since their application, remove the surface 1 inch of soil before sampling. Nutrients in the top inch of soil will probably not be available to the growing crop.

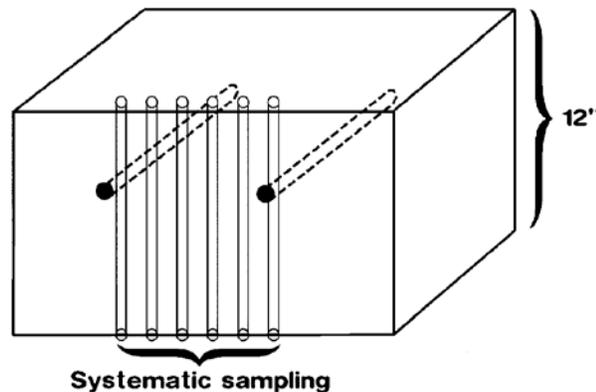


Fig. 8. Systematic soil sampling in a field where fertilizer has been banded (sampling method 1).

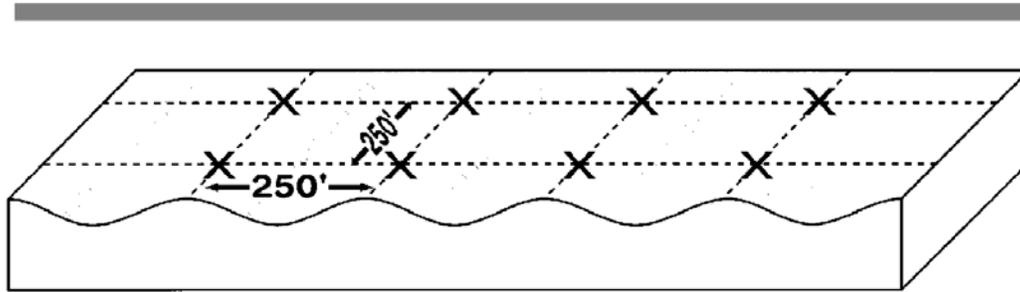


Fig. 9. Grid soil sampling pattern where samples are collected every 250 feet. Note that a complete soil sample is collected at each spot marked with an X.

If fertilizer has been banded with the no-till system, consider methods suggested in "Areas Where Fertilizer Has Been Banded." If a field has been under a continuous no-till system for a long time, determine the pH of the surface foot at 3-inch intervals (0 to 3, 3 to 6, 6 to 9, 9 to 12 inches) every 3 to 5 years. Soil pH will affect the availability of fertilizer nutrients as well as the activity of commonly used herbicides, insecticides, and fungicides.

### *Grid sampling in nonuniform fields*

Many fields are not uniform and vary both horizontally and vertically across landscapes. Traditional soil sampling procedures average nutrient levels in soil subsamples to determine average nutrient levels in the field. The nutrient values obtained are good, but the manager must realize that many of the values in the field are either less than or greater than the values determined. When fields are broken into grids with shorter distances between the sampling points a more precise soil map can be developed to determine nutrient needs.

The technology is now available to combine grid sampling with variable

rate fertilizer application to handle spatial variability within a field. These application techniques make fertilizer nutrient application more precise, resulting in greater nutrient use efficiency and reducing pollution potential.

Irrigated fields including individual pivots should be set up in a 200- to 300-foot grid for potato, sugarbeets, corn, and other potentially high-N-use crops (fig. 9). A wider grid of 400 feet may be used for small grains, beans, and other crops where N management is less intensive or under dryland conditions.

Soil nutrient needs for each segment of the grid are entered into a computer-driven system mounted on specialized commercial fertilizer application equipment. Variable rates of nutrients are then applied based on individual soil samples over the entire field.

A similar system designed for fertilizer applications through pivot sprinklers is being developed by the University of Idaho. This system has the potential to apply variable rates of nutrients and water specifically related to changes across individual fields.

The Soil Conservation Service has a digitized soil survey information system (SSIS), which when combined with the results of grid sampling provides specific information and recommendations for soils and soil types within a field. The SSIS can locate pockets of sandy or coarse-textured soils where leaching is a major concern or areas of finer-textured soils where pockets of residual N may occur. The SSIS also indicates where erosion or surface runoff may be high and where areas should be targeted for federal programs such as the Conservation Reserve Program.

Another computer-mapping technique, Geographic Information Systems (GIS), can be combined with the results of grid sampling to provide growers and land managers with information for land-use planning.

Additional information on proper soil sampling procedures can be obtained from the Extension agricultural educator or fertilizer fieldman in your county.

The authors—Robert L. Mahler, soil scientist, Moscow, and Terry A. Tindall, former Extension soil scientist, Twin Falls Research and Extension Center; both with the University of Idaho Department of Plant, Soil, and Entomological Sciences.

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, LeRoy D. Luft, Director of Cooperative Extension System, University of Idaho, Moscow, Idaho 83844. The University of Idaho provides equal opportunity in education and employment on the basis of race, color, religion, national origin, age, gender, disability, or status as a Vietnam-era veteran, as required by state and federal laws.

5,750 1990-94, 1,500 8-97 (reprint)

\$2.00

## Return to Deep Soil Sampling Project Memo



# IDAHO SOIL & WATER CONSERVATION COMMISSION

## COMMISSION

Item 5a

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**TO: CHAIRMAN WRIGHT, COMMISSIONERS GIER, RADFORD, SLICHTER, AND  
TREBESCH**  
**FROM: TERRY HOEBELHEINRICH, LOAN OFFICER**  
**DATE: March 31, 2017**  
**RE: RESOURCE CONSERVATION AND RANGELAND DEVELOPMENT PROGRAM  
UPDATE**

Since the last report date of January 3, the following activities have been conducted by staff:

Marketing	Activities
	<ul style="list-style-type: none"><li>• Attended Irrigation &amp; Equipment Show (Burley)</li><li>• Contacted 11 NRCS District Conservationists/Offices</li><li>• Attended Soil Health Symposium (Ontario)</li><li>• Attended Idaho Family Forest Owners Association (Moscow)</li><li>• Did not attend (due to inclement weather) North Central Idaho Grazing Conference in Lewiston</li><li>• Attended NRCS Technical Advisory Committee Meeting</li><li>• Evaluated Statute &amp; Rules with legal counsel for expanded or new lending options to be presented at your May meeting for consideration</li></ul>
Loan Applications	<ul style="list-style-type: none"><li>• Responded to 16 loan inquiries, performed complex assessment/evaluation of 3 inquiries</li><li>• Processed 2 applications</li><li>• Approved 2 loans (\$50,000, \$49,000)</li><li>• Disbursed on 4 loans (totaling \$251,475)</li></ul>
Loan Portfolio	<ul style="list-style-type: none"><li>• 70 loans, \$2,874,630</li><li>• \$160,919 approved, but not disbursed</li><li>• No Delinquencies</li></ul>

**ACTION:** For Information Only

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