

APPENDIX 3. - INDEX

Forms that would be needed for the following case studies described in Appendix 1:

Case Study 1: Withdrawal to simple single user	Forms 1 and 9 Input
Case Study 2: Withdrawal to aggregate users	Form 2 Worksheet and Forms 3 and 9 Input
Case Study 3: Simple community-water system	Forms 6 and 9 Input
Case Study 4: Return from simple single user	Forms 1 and 9 Input
Case Study 5: Return from aggregate users	Form 2 Worksheet and Forms 3 and 9 Input
Case Study 6: Simple community-wastewater system	Forms 8 and 9 Input
Case Study 7: Simple linked single user	Forms 1 and 9 Input
Case Study 8: Complex linked single user	Forms 1 and 9 Input
Case Study 9: Complex community-water system	Forms 4 and 5 Worksheets and Forms 6 and 9 Input
Case Study 10: Complex community-wastewater system	Forms 4 and 7 Worksheets and Forms 8 and 9 Input

Definitions of terms used in the worksheet explanations:

MCD MINOR CIVIL DIVERSION

Domestic Terms

Tpop	Total population
CWSpop	Population supplied by community-water systems
Sspop	Population that is self supplied, using own wells
PCU	Per capita use
%CWWS	Percent of household, population that has community-wastewater systems (sewered)
TDU	Total domestic use
CWSDU	Community-water system domestic use
SSDU	Self-supplied domestic use
TDCU	Total domestic consumptive use
CWWSDU	Community-wastewater system domestic use (sewered)
SDDU	Self-disposed domestic use (septic systems)

Commercial Terms

S40-49C	Coefficient for companies with SIC codes 40 through 49
#ES40-49	Number of employees employed by companies with SIC codes 40 through 49
CCU	Commercial consumptive use
CWWSCU	Community-wastewater-system commercial use
SDCU	Self-disposed commercial use
TCU	Total commercial use
CWSCU	Community-water-system commercial use
SSCU	Self-supplied commercial use

Livestock Terms

DC	Dairy coefficient
#AD	Number of Dairy cows
TLU	Total Livestock use (equals livestock withdrawals)
LCU	Livestock Consumptive Use
TLR	Total Livestock returns

Industrial Terms

S15-17C	Coefficient for companies with SIC codes 15-17
#ES15-17	Number of employees employed by companies with SIC codes 15 through 17
ICU	Industrial consumptive use
TIU	Total industrial use
CWWSIU	Community-wastewater-system industrial use (sewered)
SDIU	Self-disposed industrial use
CWSIU	Community-water-system industrial use
SSIU	Self-supplied industrial use

Irrigation Terms

SIAC	Spray irrigation acres coefficient
#acres	Number of acres
TIrU	Total Irrigation use (equals Irrigation withdrawals)
IrCU	Irrigation Consumptive Use
TIrR	Total Irrigation returns

LIST OF FORMS

- Form 1: NEWUDS input form for single users
- Form 2: Explanation of aggregate users worksheet with formulas and relations for estimating water use by geographic area
- Form 2: Worksheet for aggregate users for estimating water use by geographic area
- Form 3: NEWUDS input form for aggregate of users
- Form 4: Explanation of community system worksheet with formulas and relation for estimating water use by geographic area with more than one distribution or collection system.
- Form 4: Worksheet for community systems for estimating water use by geographic area with more than one distribution or collection system.
- Form 5: Worksheet for recording and estimating water use by community-water systems
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- Form 9: NEWUDS input form for transaction/rate data

Form 1. NEWUDS Input Form for Single Users

System ID System Name System Type Use Type NEUse Code

Owner ID Owner Name Owner Type SIC code SIC Code code

Address ID Mail Line1 Street Line1 Contact Name Phone Address type code

City State Zip City State Zip

Location ID Location Name Location Scale Location Scale Code

State code County code MCD code HUC code State Basin code

Latitude Longitude Location Det Method LDM code

Site ID	Site Type	Withdrawal Site or Distribution Name	Conv ID	Action	Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Return Site or Collection Name
Site ID	Resource ID	Resource Name								Site ID	Resource ID	Resource Name

Appendix 3_Form 1. NEWUDS input form for single users.

Form 2. Explanation of Aggregate of Users Worksheet

Area Name Year

Domestic			
Total Population	Tpop	Total Domestic use	TDU = Tpop x PCU
Community Water System	CWSpop	Domestic CWS	CWSDU = %CWS x TDU
Self Supply	Sspop = Tpop - CWSpop	Domestic SS	SSDU = TDU - CWSDU
Percent on CWS	%CWS = CWSpop/Tpop	Con Use	TDCU = TDU x 0.15
Per capita use	PCU	Domestic CWWS	CWWSDU = (TDU - TDCU) x %CWWS
Percent CWWS	%CWWS	Domestic SD	SDDU = TDU - TDCU - CWWSDU
Est SW	Est A1 %A1Pop	Est A2 %A2Pop	A3 %A3Pop
0.00	SSDU x %A1Pop	SSDU x %A2Pop	SSDU x %A3Pop

Commercial			
SIC group	IWRMAIN Coefficient (gal/day/employee)	Number of employees	Estimated Use (Mgal/d)
40-49	S40-49C = 51	#ES40-49	S40-49C x #ES40-49/1000000
50-59	S50-59C = 58	#ES50-59	S50-59C x #ES50-59/1000000
60-67	S60-67C = 71	#ES60-67	S60-67C x #ES60-67/1000000
70-89	S70-89C = 106	#ES70-89	S70-89C x #ES70-89/1000000
91-92	S91-92C = 71	#ES91-92	S91-92C x #ES91-92/1000000
Consumptive Use	CCU = TCU x 0.1	Total Use	TCU = Σ SC x #ES
Estimated CWWS	CWWSUCU = (TCU - CCU) %CWWS	Estimated CWS	CWWSUCU = TCU x %CWS
Estimated SD	SDDCU = TCU - CCU - CWWSUCU	Estimated SS	SSCU = TCU - CWWSUCU
Est SW %SW	Est A1 %A1	Est A2 %A2	A3 %A3
SSCU x %SW	SSCU x %A1	SSCU x %A2	SSCU x %A3

Livestock			
Animal Group	Coefficient (gal/day/an)	Number of animals	Estimated Use (Mgal/d)
Dairy	DC = 30	#AD	DC x #AD / 1000000
Cattle	CC = 20	#AC	CC x #AC / 1000000
Pigs	PC = 5	#AP	PC x #AP / 1000000
Sheep	SC = 5	#AS	SC x #AS / 1000000
Chickens	ChC = 0.01	#Ach	ChC x #Ach / 1000000
		Total use	TLU = Σ AC x #A
Consumptive Use	LCU = TLU x 0.5	Return	TLR = TLU - LCU
Estimated SW %SW	Est A1 %A1	Est A2 %A2	A3 %A3
TLU x %SW	TLU x %A1	TLU x %A2	TLU x %A3

Appendix 3 Form 2a. Explanation of aggregate of users worksheet with formulas and relations for estimating water use by geographic area. [SW, Surface water; A1, Crystalline-rock Aquifers; A2, Glacial Deposit Aquifers; A3, NE Sandstone-rock Aquifers]

Form 2. Explanation of Aggregate of Users Worksheet

Industrial

SIC group	IWRMAIN Coefficient	Number of employees	Estimated Use
15-17	S15-17C = 35	#ES15-17	S15-17C x #ES15-17
20	S20C = 469	#ES20	S20C x #ES20
21	S21C = 0	#ES21	S21C x #ES21
22	S22C = 315	#ES22	S22C x #ES22
23	S23C = 13	#ES23	S23C x #ES23
24	S24C = 78	#ES24	S24C x #ES24
25	S25C = 30	#ES25	S25C x #ES25
26	S26C = 863	#ES26	S26C x #ES26
27	S27C = 42	#ES27	S27C x #ES27
28	S28C = 289	#ES28	S28C x #ES28
29	S29C = 1045	#ES29	S29C x #ES29
30	S30C = 119	#ES30	S30C x #ES30
31	S31C = 148	#ES31	S31C x #ES31
32	S32C = 202	#ES32	S32C x #ES32
33	S33C = 178	#ES33	S33C x #ES33
34	S34C = 95	#ES34	S34C x #ES34
35	S35C = 58	#ES35	S35C x #ES35
36	S36C = 71	#ES36	S36C x #ES36
37	S37C = 63	#ES37	S37C x #ES37
38	S38C = 66	#ES38	S38C x #ES38
39	S39C = 36	#ES39	S39C x #ES39
Consumptive Use	ICU = TIU x 0.1	Total use	TIU = $\sum SC \times \#ES$
Estimated CWWS	CWWSIU = (TIU - ICU) x %CWWS	Estimated CWS	CWSIU = TIU x %CWS
Estimated SD	SDIU = TIU - ICU - CWWSIU	Estimated SS	SSIU = TIU - CWSIU
Est SW % SW	Est A1 % A1	Est A2 % A2	A3 % A3
TIU x %SW	TIU x %A1	TIU x %A2	TIU x %A3

Irrigation			
Irrigation type	Coefficient (inches/acre)	Number of acres	Estimated Use
Spray	SIAC	#acres	SIAC x #acres
Drip	DIAC	#acres	DIAC x #acres
Furrow	FIAC	#acres	FIAC x #acres
		Total Use	TIrU = $\sum (SDF)IAC \times \#acres$
Consumptive Use	TIrCU = TIrU x 0.9	Return	TIrR = TIrU - TIrCU
Est SW % SW	Est A1 % A1	Est A2 % A2	A3 % A3
TIrU x %SW	TIrU x %A1	TIrU x %A2	TIrU x %A3

Appendix 3_Form 2a. Explanation of aggregate of users worksheet with formulas and relations for estimating water use by geographic area. [SW, Surface water; A1, Crystalline-rock Aquifers; A2, Glacial Deposit Aquifers; A3, NE Sandstone-rock Aquifers]
--Continued

Form 2. Aggregate of Users Worksheet

Area Name Year

Domestic			
Total Population	<input style="width: 100px;" type="text"/>	Total Domestic use	<input style="width: 100px;" type="text"/>
Community Water System	<input style="width: 100px;" type="text"/>	Domestic CWS	<input style="width: 100px;" type="text"/>
Self Supply	<input style="width: 100px;" type="text"/>	Domestic SS	<input style="width: 100px;" type="text"/>
Percent on CWS	<input style="width: 100px;" type="text"/>	Con Use	<input style="width: 100px;" type="text"/>
Per capita use	<input style="width: 100px;" type="text"/>	Domestic CWWS	<input style="width: 100px;" type="text"/>
Percent CWWS	<input style="width: 100px;" type="text"/>	Domestic SD	<input style="width: 100px;" type="text"/>
Est SW	Est A1	Est A2	A3
<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>

Commercial			
SIC group	IWRMAIN Coefficient (gal/day/employee)	Number of employees (Mgal/d)	Estimated Use (Mgal/d)
40-49	51	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
50-59	58	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
60-67	71	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
70-89	106	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
91-92	71	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
Consumptive Use	<input style="width: 100px;" type="text"/>	Total Use	<input style="width: 100px;" type="text"/>
Estimated CWWS	<input style="width: 100px;" type="text"/>	Estimated CWS	<input style="width: 100px;" type="text"/>
Estimated SD	<input style="width: 100px;" type="text"/>	Estimated SS	<input style="width: 100px;" type="text"/>
Est SW	Est A1	Est A2	A3
<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>

Livestock			
Animal Group	Coefficient (gal/day/an)	Number of animals	Estimated Use (Mgal/d)
Dairy	30	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
Cattle	20	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
Pigs	5	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
Sheep	5	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
Chickens	0.01	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>
Consumptive Use	<input style="width: 100px;" type="text"/>	Total use	<input style="width: 100px;" type="text"/>
Estimated SW	Est A1	Est A2	A3
<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>	<input style="width: 100px;" type="text"/>

Appendix 3 Form 2b. Worksheet for aggregate of users for estimating water use by geographic area. [SW, Surface water; A1, Crystalline-rock Aquifers; A2, Glacial Deposit Aquifers; A3, NE Sandstone-rock Aquifers]

Form 2. Aggregate of Users Worksheet

Industrial

SIC group	IWRMAIN Coefficient	Number of employees	Estimated Use
15-17	35		
20	469		
21	0		
22	315		
23	13		
24	78		
25	30		
26	863		
27	42		
28	289		
29	1045		
30	119		
31	148		
32	202		
33	178		
34	95		
35	58		
36	71		
37	63		
38	66		
39	36		
Consumptive Use		Total use	
Estimated CWWS		Estimated CWS	
Estimated SD		Estimated SS	
Est SW	Est A1	Est A2	A3

Irrigation			
Irrigation type	Coefficient (inches/acre)	Number of acres	Estimated Use
Spray			
Drip			
Furrow			
		Total Use	
Consumptive Use		Return	
Est SW	Est A1	Est A2	A3

Appendix 3_Form 2b. Worksheet for aggregate of users for estimating water use by geographic area. [SW, Surface water; A1, Crystalline-rock Aquifers; A2, Glacial Deposit Aquifers; A3, NE Sandstone-rock Aquifers]--Continued

Form 3. NEWUDS Input Form for Aggregate of Users

System ID			System Name	
			System Type code	5
Location ID			Location Name	
			Location Determination Method Code	2
State		County		CO Code
State code		MCD		MCD code

Site ID	Use Code	Site Type	General Ground-water Withdrawals	Resource ID	Resource Name
	78	1			
	78	1			
	78	1			
Site ID	Use	Site Type	Local Distribution System		
	60	12			
	60	12			
	60	12			
	60	12			
Site ID	Use	Site Type	User	From Sites	To Sites
	67	24	DOM		
	79	24	COM		
	80	24	IND		
	1	24	IRR		
	81	24	LVS		
		24			
Site ID	Use	Site Type	Local Collection System		
	61	14			
	61	14			
	61	14			
Site ID	Use	Site Type	General Ground-water Returns	Resource ID	Resource Name
	78	5			
	78	5			
	78	5			

From Site ID	To Site ID	Conveyance ID	Action	From Site ID	To Site ID	Conveyance ID	Action

Appendix 3_Form 3. NEWUDS input form for aggregate of users.

Form 4. Explanation of Community System Worksheet for Geographic Areas with More Than One Distribution or Collection System

MCD Name

Year

Domestic							
Supply	Population	Domestic withdrawals and deliveries		Domestic Consumptive Use	Disposal	Population	Domestic Releases and Returns
Total for MCD	Tpop	TDU = from Form 2		TDCU= from Form 2	Total for MCD	Tpop	TDR = TDU-TDCU
Community Water System	CWSpop	CWSDU = CWSpop*PCU/1000000		CWSDCU= CWSDU*0.15	Community Wastewater System	CWWSpop	CWWSDR = TDR*%CWWS
CWS1	CWS1pop	CWS1DU = CWS1pop*PCU/1000000		CWS1DCU = CWS1DU*0.15	CWWS1	CWWS1pop	CWWS1DR = CWWSDR*(CWWS1pop/CWWSpop)
CWS2	CWS2pop	CWS2DU= CWS2pop*PCU/1000000		CWS2DCU = CWS2DU*0.15	CWWS2	CWWS2pop	CWWS2DR = CWWSDR*(CWWS2pop/CWWSpop)
CWS3	CWS3pop	CWS3DU = CWS3pop*PCU/1000000		CWS3DCU = CWS3DU*0.15	CWWS3	CWWS3pop	CWWS3DR = CWWSDR*(CWWS3pop/CWWSpop)
Percent on PS	%CWS = CWSpop/Tpop				Percent on CWWS	%CWWS = CWWSpop/Tpop	
Per capita use	PCU						

Appendix 3_Form 4a. Explanation of community system worksheet with formulas and relation for estimating water use by geographic area with more than one distribution or collection system.

Form 4. Explanation of Community System Worksheet for Geographic Areas with More Than One Distribution or Collection System

MCD Name Year

Commercial						
	% of land use area in Distribution System	Total Commercial withdrawals and deliveries	Commercial Consumptive Use		% of land use area in Collection System	Commercial Returns and Releases
Total for MCD	1.00	TCU = from Form 2	CCU = from Form 2	Total for MCD	1.00	TDDR = TCU-CCU
Community Water System	%CLUCWS	CWSCU = from Form 2	CWSCCU = from Form 2	Community WW System	%CLUCWWS	CWWSCU = from Form 2
CWS1	%CLUCWS1	CWS1CU = CWSCU * (%CLUCWS1/(%CLUCWS))	CWS1CCU = CWS1CU * 0.10	CWWS1	%CLUCWWS1	CWWS1CU = CWWSCU * (%CLUCWWS1/(%CLUCWWS))
PS2	%CLUCWS2	CWS2CU = CWSCU * (%CLUCWS2/(%CLUCWS))	CWS2CCU = CWS2CU * 0.10	CWWS2	%CLUCWWS2	CWWS2CU = CWWSCU * (%CLUCWWS2/(%CLUCWWS))
PS3	%CLUCWS3	CWS3CU = CWSCU * (%CLUCWS3/(%CLUCWS))	CWS3CCU = CWS3CU * 0.10	CWWS3	%CLUCWWS3	CWWS3CU = CWWSCU * (%CLUCWWS3/(%CLUCWWS))

Industrial						
	% of land use area in Distribution System	Total Industrial withdrawals and deliveries	Industrial Consumptive Use		% of land use area in Collection System	Industrial Returns and Releases
Total for MCD	1.00	TIU = from Form 2	ICU = from Form 2	Total for MCD	1.00	TIR = TIU-ICU
Community Water System	%ILUCWS	CWSIU = from Form 2	CWSICU = from Form 2	Community WW System	%ILUCWWS	CWWSIU = from Form 2
CWS1	%ILUCWS1	CWS1IU = CWSIU * (%ILUCWS1/(%ILUCWS))	CWS1ICU = CWS1IU * 0.10	CWWS1	%ILUCWWS1	CWWS1IU = CWWSIU * (%ILUCWWS1/(%ILUCWWS))
CWS2	%ILUCWS2	CWS2IU = CWSIU * (%ILUCWS2/(%ILUCWS))	CWS2ICU = CWS2IU * 0.10	CWWS2	%ILUCWWS2	CWWS2IU = CWWSIU * (%ILUCWWS2/(%ILUCWWS))
CWS3	%ILUCWS3	CWS3IU = CWSIU * (%ILUCWS3/(%ILUCWS))	CWS3ICU = CWS3IU * 0.10	CWWS3	%ILUCWWS3	CWWS3IU = CWWSIU * (%ILUCWWS3/(%ILUCWWS))

Appendix 3_Form 4a. Explanation of community system worksheet with formulas and relation for estimating water use by geographic area with more than one distribution or collection system --Continued.

Form 4. Community System Worksheet for Geographic Areas with More Than One Distribution or Collection System

MCD Name

Year

Domestic						
Supply	Population	Domestic withdrawals and deliveries	Domestic Consumptive Use	Disposal	Population	Domestic Releases and Returns
Total for MCD				Total for MCD		
Community Water System				Community Wastewater System		
CWS1				CWWS1		
CWS2				CWWS2		
CWS3				CWWS3		
Percent on PS				Percent on CWWS		
Per capita use						

MCD Name

Year

Commercial						
	% of land use area in Distribution System	Total Commercial withdrawals and deliveries	Commercial Consumptive Use		% of land use area in Collection System	Commercial Returns and Releases
Total for MCD	1.00			Total for MCD	1.00	
Community Water System				Community WW System		
CWS1				CWWS1		
PS2				CWWS2		
PS3				CWWS3		

Appendix 3_Form 4b. Worksheet for community systems for estimating water use by geographic area with more than one distribution or collection system.

Form 4. Community System Worksheet for Geographic Areas with More Than One Distribution or Collection System

Industrial						
	% of land use area in Distribution System	Total Industrial withdrawals and deliveries	Industrial Consumptive Use		% of land use area in Collection System	Industrial Returns and Releases
Total for MCD	1.00			Total for MCD	1.00	
Community Water System				Community WW System		
CWS1				CWWS1		
CWS2				CWWS2		
CWS3				CWWS3		

Appendix 3_Form 4b Worksheet for community systems for estimating water use by geographic area with more than one distribution or collection system--Continued.

Form 5. Community-Water System Worksheet

Community-Water System Name Year
 Population Served Per Capita

Withdrawals to Regional Distribution System								
Resource Transfers	Rate	Withdrawal Points	Withdrawal Rate	Treatment Plant	Treatment Plant Deliveries	Primary Reg Distribution System	Deliveries	Primary Regional Unaccount

From Regional/Local Distribution to Users								
Secondary Regional Distribution System	Deliveries	Local Distribution System	Total Deliveries	Domestic	Commercial	Industrial	Local Distribution System Unaccount	Secondary Regional Unaccount

Appendix 3_Form 5. Worksheet for recording and estimating water use by community-water systems.

Form 7. Community-Wastewater Systems Worksheet

Community-wastewater system Name Year
 Population Served Per Capita

From Users to Local/Regional Collection								
	Releases by Domestic Users	Releases by Commercial Users	Releases by Industrial Users	Total Releases from all Users to Local System	Total Deliveries from Local System	Local Collection System Inflow & Infiltration	Total Deliveries from Regional System	Regional Collection System Inflow & Infiltration
Local Collection System								

From Collection System to Returns								
	Discharge Rate	Discharge Pipes	Discharge Rate	Resource				
Wastewater Treatment Plant								

Appendix 3_Form 7. Worksheet for recording and estimating water use by community-wastewater systems.

