RBDMS WaterSTAR

GWPC 2020 Virtual Annual Forum

Dan Yates, Associate Director GWPC

Joe Lee, Project Manager







AGENDA

- Why This Application is Needed
- What are the Capabilities of WaterSTAR
- Who are the Current Users of WaterSTAR
- Cross-Agency Benefits
- Phase 1 Application Overview
- Technology
- Phase 1 Production Applications







The Need for RBDMS WaterSTAR





Why develop RBDMS WaterSTAR?

Need for water quality tracking and reporting continues to grow.

Opportunity to change the historically disjointed systems used for water data.

Foster cross-agency and state collaboration and reduce agency effort and cost.

Database structured to accommodate the needs of any agency.





What is WaterSTAR?

High-level Functionality	Agency	Industry	Public
Manages laboratory analytical and field data for all environmental matrices.	\sim		
Electronically receives validated data from laboratories and industry users, eliminating data entry.	\checkmark		
Manage sample result submissions.	\sim		
Alerting agency users when labs submit sample result reports that exceed limits flagged as acceptable for specific parameters.	\checkmark		
Manage access to confidential data.	\sim		
Ability to securely submit Electronic Data Deliverables (EDD) with front-end validation checks.	\checkmark	\sim	
View and analyze validated data through various statistical, charting outputs, and integrated GIS from multiple sources and agencies.	\checkmark	\checkmark	\checkmark
View high-level aggregate data both visualized and in reports.	\sim	\checkmark	\sim
Download validated data.	\sim	\sim	\sim





States using all or portions of WaterSTAR

- ✓ Alabama Geological Survey
- ✓ California DOGGR
- ✓ Colorado COGCC
- ✓ Nebraska DEE
- ✓ Ohio Division of Mineral Resource Management
- ✓ Wyoming DEQ
- \checkmark Wyoming Oil and Gas





Cross-Agency Benefits





How it Benefits You

View multiple organization and agency datasets from a single application.

Intuitive User Interface drives user satisfaction and adoption.



Electronic data submission, validation, and workflows reduce staff effort and cost. Configurable roles and security maintain confidential data.





Phase 1 Application Overview





Phase 1 Development

The RBDMS WaterSTAR application is:

- Designed to be integrated into any agency data system.
- Configurable to meet an agency's UI/UX needs.
- Part of the RBDMS suite of products. All RBDMS states will have access to developed functionality and future functionality.
- Currently being updated and implemented with the Nebraska Department of Environment and Energy and Wyoming Department of Environmental Quality.





Good Life. Great Resources.

DEPT. OF ENVIRONMENT AND ENERGY



WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY



Before

 Sector de la construcción de la constr	1. Select Search Criteria: • County	5. Well Depth (Default is all records):	Ground Water Quality Data Query Results
 Claritation Number Claritation Number Select the Analytic) from the following list: The select will be presented on the Select multiple in the S	O Well Location		Selected By County:
Concertained working Function working that The posting that Th		Specify Minimum Well Depth:	
Section the adjusting list: heading lis		Specify Maximum Well Depth:	Counties Selected :'Antelope'
 Select the Well Type from the following list: (Use CTR: or SHIT and Left Would be advected by a set of the sense in database recomposed. Set of the sense database recomposed. Set of the sense database			
minimized balance mark (sp., found or charge in the balance mark (sp., found or cha	2. Select the Analyte(s) from the following list: The pesticide	6 Falact the Wall Type from the following list:	
 Manuscal Marketti of the densitie for early e only and desities for early e only an			
Information territery lystem or the discretery lystem or the discrete lystem or the discretery lystem or the di		· · ·	
Select Well Use		items)	
Select Well Use Select Well Use Select Well Use Commercial industrial			
Additional and round additional water and adds and regulations for these compounds, wat to these the spread hand you want to use the data in a close the spread hand you want to use the spread hand you want to use the data in a close the spread hand you want to use the data in a close the spread hand you want to use the data in a close the spread hand you want to use the data in a close the spread hand you want to use the data in a close the spread hand you want to use the spread hand you want to us		Select Well Use	
To learn more about drinking water standards and regulations for these compounds, with the user learning water standards and regulations for these compounds, with the user learning water standards and regulations for these compounds, with the user learning water standards and regulations for these compounds, with the user learning water standards and regulations for these compounds and r	not constitute an endorsement.		NUMBER OF RECORDS: 10062
<pre>these compounds, exit to the USERA's Drinking Water Manifest Markanings water Marken Mar</pre>	To learn more about drinking water standards and regulations for		Clearinghouse# Township Range Direction Section SubSection NRD County WellDepth ScreenDepth WellType Contaminant DateSampled Concentration ReportingLimit QualityFlag SampleID AgencyCode
Autorest website: Select Analyte(s): Number of Analyses - 660405 Number	these compounds, exit to the USEPA's Drinking Water Health		3216 [23 5] N 4 [00] Upper Elkhorn Antelope] 228 [152-227] [] acetochlor 07/15/1997] 0 0. 05 [] [W (64833] [5629] 01/66/1376]]]]]
Select Analyte(s): Number of Analyses - 460405 (Number) -	Advisories website.		3216 23 5 W 4 DO Upper Elkhorn Antelope 228 152-227 I atrazine 07/15/1997 0 0.05 2 UN 648831 56299 01/06/1976 UU
Select Analyte(): Humber of analyses - id-dbalase. International sets (1): Humber of analyses - id-dbalase. International sets (2): Humber of analyses - i		(react amp (ordene water oddroe)	
Rumber of analyses in database. // . Select the projection (if you want to use the data in a file system). // . Select the projection (if you want to use the data in a file system). 11_stemportaneous (10) Isystem). None Isystem). None Isystem).	Select Analyte(s) : Number of Analyses - 460405		3216 23 5 W 4 D0 Upper Elkhorn Antelope 228 152-227 I deethylatrazine 07/15/1997 0 0.05 2 UN G48831 56299 01/06/1976 UV
1.1 - double end (3) 224 columbe end (3) 224 columb end (3) 224 columb end (3) </td <td>(Number) = number of analyses in database.</td> <td>7. Select the projection (if you want to use the data in a</td> <td>3216 23 5 W 4 D0 Upper Elkhorn Antelope 228 152-227 I deisopropylatrazine 07/15/1997 0 0.1 2 UN 648831 56299 01/06/1976 </td>	(Number) = number of analyses in database.	7. Select the projection (if you want to use the data in a	3216 23 5 W 4 D0 Upper Elkhorn Antelope 228 152-227 I deisopropylatrazine 07/15/1997 0 0.1 2 UN 648831 56299 01/06/1976
12.4-control-Monoscentrate (3) 12.4-control-Monoscentrate	All	GIS system).	3216/23/5/W/4/D0/Upper Elkhorn/Antelope/228/152-227/I/metolachlor/07/15/1997/0/0.05/2//UN/G48831/56299/01/06/1976/////
Use CTRL or SHIFT and Left Mouse button to select multiple list how setup to select multiple list of the spreadsheet Directions OUTM (Zone 14, Nad 83, Meters) Lat/Long (Decimal Degrees) Southal are available at pestide data are available at pestide Data using frame-link data link at the top of this page) OUTM (Zone 14, Nad 83, Meters) Lat/Long (Decimal Degrees) Southal are available at pestide Data using frame-link data link at the top of this page) OUTM (Zone 14, Nad 83, Meters) Southal are available at the moto select multiple list are available at the spreadsheet Directions Southal are ranked (refor To aller) Southal bate (a subset of the spreadsheet.) Southal (refor To aller) Southal (refor To	1,2,4-trichlorobenzene (35)	None	3216 [23 5] 4 6 00 Upper Elkhorn Antel.ope 228 152-227 I metribuzin 67/15/397 6 0.6 5 2 W [648831 56299 101/66/1375
(Use CTRL or SHIFT and Left Mouse button to select multiple list field per class provide select multiple list fuels per class provide select multiple list memory and per class provide select multiple list to appendix provide select multiple list to app	1,2-dibromo-3-chloropropane (236)		3216 [23] 5 4 0 0 0 0 = Elkhorn antelope 226 32-227 1 ntrate-n 07/01/1990 3.3 0.1 2 40 01 01 3.7 01 10 3.3 0.1 2 40 01 01 10 10 10 10 10 10 10
<pre>items) Additional pesticide data are available at Pesticide Data Using Enzyme-Linked Immunosorbent Asay ELISA for Nebraka Ground Water. 3. Clearinghouse Quality Flag:(To learn more about how these data are anked, refer to Tables 1 and 2 in the metadata link at the top of this page) (Use CTRL or SHIFT and Left Mouse button to select multiple tems.) Metadate are available at the use of this page Use Contaminant Name Second End Contaminant Name Aggency Code Aggency</pre>	(Use CTRL or SHIFT and Left Mouse button to select multiple list		3216 [23]5]4 [4]00] Upper Elkhorn [Antelope] 228 [152-227] []nitrate-N [07/03/1996] [2.9] 0.1 [4] [UKRND [04831] [55299] [01/06/1976] []]
Additional pesticide data are available at Pesticide Data Using Enzyme_Linked Immunosorbent Assay <u>ELISA</u> for Nebraska Ground Water. 3. Clearinghouse Quality Flag: (To learn more about how these data are ranked, refer to Tables 1 and 2 in the metadata link at the top of this page) (Use CTRL or SHIFT and Left Mouse button to select multiple terms or deselect items.) 9. Sorted By: NRD, County, Legal Description, Clearinghouse #. User Optional Sort Choices. Sample Data (as m/d/yvyv - Default is full period): 8. Agency Code 9. Sorted By: NRD, County, Legal Description, Clearinghouse #. 9. Sorted By: NRD, County =. 9. Sorted By: NRD, County =		OLat/Long (Decimal Degrees)	3216 23 5 W 4 D0 Upper Elkhorn Antelope 228 152-227 I nitrate-N 07/12/1999 4.5 0.1 2 UENRD 648831 56299 01/06/1976 U 1
Enzyme_Linked Immunosorbent Assay ELISA for Nebraska Ground Water. 3. Cherringhouse Quality Flag:(To learn more about how these the top of this page) (Use CTRL or SHIFT and Left Mouse button to select multiple terms or deselect items.)			3216 23 5 W 4 D0 Upper Elkhorn Antelope 228 152-227 I nitrate-N 08/15/2000 3.9 0.1 3 UENRD 648831 56299 01/06/1976 UIII
Ground Water: 3. Clearinghouse Quality Flag: (To learn more about how these data are ranked, refer to Tables 1 and 2 in the metadata link at the top of this page) (Use CTRL or SHIFT and Left Mouse button to select multiple terms or deselect items.) 9. Sorted By: NRD, County, Legal Description, Clearinghouse #. (Use CTRL or SHIFT and Left Mouse button to select multiple terms or deselect items.) 9. Sorted By: NRD, County, Legal Description, Clearinghouse #. 9. Sorted By: NRD, County, Legal Description, Clearinghouse #		8. Output Format:	3216[23]5[4]6]UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU
 3. Clearinghouse Quality Flag: (To learn more about how these data link at the top of this page) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Web Page Table : (a subset of the spreadsheet.) O Sorted By: NRD, County, Legal Description, Clearinghouse #. O Sorted By: NRD, County, Legal Description, Clearinghouse #. O Sorted By: NRD, County, Legal Description and table is the contain and table is the			3216 23 5 W 4 D0 Upper Elkhorn Antelope 228 152-227 I nitrate-N 07/14/2005 6.2 0.1 3 2005813 UENRD 648831 56299 01/06/1976 11 11
 3. Chearinghouse Quality Flag:(To learm more about how these data are ranked, refer to Tables 1 and 2 in the metadata link at the top of this page) (Use CTRL or SHIFT and Left Mouse button to select multiple items or deselect items.) 9. Sorted By: NRD, County, Legal Description, Clearinghouse #. User Optional Sort Choices. 9. Sorted By: NRD / County items or deselect items.) 1. Jappendic County items or deselect items.) 0. Web Page Table 1: (a SUDSEt of the SpreadSneet.) 9. Sorted By: NRD, County, Legal Description, Clearinghouse #. 1. Jappendic County items or deselect items.) 0. Sorted By: NRD / County items or deselect items.) 0. Sample Date 0. Sample Date 0. Sample Data (as m/d/yvyy - Default is full period): 1. Sample Data (as m/d/yvyy - Default is full period): 1. Sample Data (as m/d/yvyy - Default is full period): 1. Sample Data (as m/d/yvyy - Default is full period): 			3216 [23]5 W 4 DO Upper Elkhorn Antelope] [28] [32-227] Intrate-N 07/17/2006] . 39 0. 1] 2000 (2000) [03/06/1976]
the top of this page) (Use CTRL or SHIFT and Left Mouse button to select multiple (Items or deselect items.) 9. Sorted By:NRD,County,Legal Description,Clearinghouse #. Use CTRL or SHIFT and Left Mouse button to select multiple Items or deselect items.) 9. Sorted By:NRD,County,Legal Description,Clearinghouse #. 0. Sorted By:NRD,County,Legal Description,Clearinghouse #. <		OWeb Page Table : (a subset of the spreadsheet.)	3216 23 5 W 4 DO Upper Elkhorn Antelope 228 152-227 I nitrate-N 08/19/2008 5.6 0.1 3 2008438 UENRD 648831 56299 01/06/1976
(Use CTRL or SHIFT and Left Mouse button to select multiple items or deselect items.) 9. Sorted By:NRD,County,Legal Description,Clearinghouse #. User Optional Sort Choices. Sample Data 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			
Items or deselect items.) User Optional Sort Choices. Jable 23 5 w 100 Upper Elkhorn Antelope [228 122-227] nitrate-w 097/21/2041 5.5 0.1 4 201344 Ukm0 04831 5629 01/66/1976		9. Sorted By:NRD.County.Legal Description.Clearinghouse #.	3216 23 5 W 4 DO Upper Elkhorn Antelope 228 152-227 I nitrate-N 06/15/2012 5.7 0.1 2 2012914 UENRD 648831 56299 01/06/1976 01/06/1976
Sample Data (as m/d/yyyy - Default is full period): Sample Data (as m/d/yyyy - Default is full period):	items or deselect items.)		3216 [23]5 W 4 DO Upper Elkhorn Antelope 228 152-227 1 ntrate-N 96/127/2013]- 4 0.12 2013957 UEND 0.48831 55/297 0.1/96/1376
1 3216 [3] [3] [4] [4] [0] [4] [3] [2-227] [1] interte-iii [47]/57/[32] [3], [6], 1] [4] [3] [27/55] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48831] [5:29] [10]/66/[376] [1000 [48			3216 23 5 W 4 D0 Upper Elkhorn Antelope 228 152-227 I nitrate-N 07/30/2015 3.7 0.1 4 2015190 UENRD 648831 56299 01/06/1976 11 11
Contaminant Name 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [pendimethalin/87/15/97976](8.65]2 UN/G4883156299 Agency Code 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [pendimethalin/87/15/97976](8.65]2 UN/G4883156299 Agency Code 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [pendimethalin/87/15/97976](8.65)2 UN/G4883156299 Agency Code 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [pendimethalin/87/15/97976](8.65)2 UN/G4883156299 Agency Code 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [pendimethalin/87/15/97976](8.65)2 UN/G4883156299 Asample Data (as m/d/yyyy - Default is full period): 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [propatine/87/15/19976](8.65)2 UN/G4883156299](81/06/1976/IIIII) 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [propatine/87/15/19976](8.65)2 UN/G4883156299](81/06/1976/IIIII) 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [propatine/87/15/19976](8.65)2 UN/G4883156299](81/06/1976/IIIII) 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [propatine/87/15/19976](8.65)2 UN/G4883156299](81/06/1976/IIIII) 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [propatine/87/15/19976](8.65)2 UN/G4883156299](81/06/1976/IIIII) 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [propatine/87/15/19976](8.65)2]UN/G4883156299 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [propatine/87/15/19976](8.65)2]UN/G4883156299 3216/318/W 4/00/upper Elkhorn/Antelope/228/152-227/I [propatine/87/15/19976](8.65)2]UN/G4883156299 3216/318/W 4/00/Upper Elkhorn/Antelope/			3216 [23] 5 W 4 DU Upper Elkhronn antelope 228 152-227 1 nttrate-N 07/14/2016 1.59 1.4 2010602 UENRU 0.48831 55299 11/66 1976
4 3216 [2] [3] [4] [0] Upper Elkhorn Antelope [228] [52-227] [] prometon [67/15/1997] [6]. 65 [2] [UN [G48331 [5229] [0]/66/1976] []] []] 3216 [2] [3] [4] [0] Upper Elkhorn Antelope [228] [52-227] [] prometon [67/15/1997] [6]. 65 [2] [UN [G48331 [5229] [0]/66/1976] []] []] 3216 [2] [3] [4] [0] Upper Elkhorn Antelope [228] [52-227] [] prometon [67/15/1997] [6]. 65 [2] [UN [G48331 [5229] [0]/66/1976] []] []] 3216 [2] [3] [4] [0] Upper Elkhorn Antelope [228] [52-227] [] prometon [67/15/1997] [6]. 65 [2] [UN [G48331 [5229] [0]/66/1976] []] []] 3216 [2] [3] [4] [0] Upper Elkhorn Antelope [228] [52-227] [] prometon [67/15/1997] [6]. 65 [2] [UN [G48331 [5229] [0]/66/1976] []] []] 3216 [2] [3] [4] [0] Upper Elkhorn Antelope [228] [52-227] [] prometon [67/15/1997] [6]. 65 [2] [UN [G48331 [5229] [0]/66/1976] []] []] 3216 [2] [3] [4] [0] Upper Elkhorn Antelope [228] [52-227] [] prometon [67/15/1997] [6]. 65 [2] [UN [G48331 [5229] [0]/66/1976] []] []] 3216 [2] [3] [4] [0] Upper Elkhorn [Antelope [228] [52-227] [] prometon [67/15/1997] [6]. 65 [2] [UN [G48331 [5229] [0]/66/1976] []] []] 3216 [2] [3] [4] [0] Upper Elkhorn [Antelope [228] [52-227] [] prometon [67/15/1997] [6]. 65 [2] [UN [G48331 [5229] [0]/66/1976] []] []] 3216 [2] [3] [4] [0] Upper Elkhorn [Antelope [228] [52-227] [] [1/167(218) [1/16	2 3	Contaminant Name	3216 23 5 W 4 DO Upper Elkhorn Antelope 228 152-227 I pendimethalin 07/15/1997 0 0.05 2 UN 648831 56299 01/06/1976 UIII
3216 [23] § 4 00 Upper E Ekhorn Antelope 228 152-227 [propachice 07/15/1997 0].e.6] 2 UN G48831 56299 01/66/1976 3216 23 542 10 UPper Ekhorn Antelope 228 152-227 1 propacine 07/15/1997 0].e.6] 2 UN G48831 5629 01/66/1976 3216 23 542 10 UPper Ekhorn Antelope 228 152-227 1 propacine 07/15/1997 0].e.6] 2 UN G48831 5629 01/66/1976 3216 23 544 10 Upper Ekhorn Antelope 228 152-227 1 printing 07/15/1997 0].e.6] 2 UN G48831 5629 01/66/1976 3216 23 544 10 Upper Ekhorn Antelope 228 152-227 1 printing 07/15/1997 0].e.6] 2 UN G48831 5629 01/66/1976 3216 23 544 10 Upper Ekhorn Antelope 228 152-227 1 printing 07/15/1997 0].e.6] 2 UN G48831 5629 01/66/1976 3216 23 544 10 Upper Ekhorn Antelope 228 152-227 1 printing 07/15/1997 0].e.6] 2 UN G48831 5629 01/66/1976	4	Agency Code	3216 23 5 W 4 D0 Upper Elkhorn Antelope 228 152-227 I prometon 07/15/1997 0 0.05 2 UN 648831 56299 01/06/1976 UIII
3216[23]5]W 4[00]Upper E1khorn antelope]228]152-227][1]stmaile]#07/15/1997]0[0.05][2][W](64833]56299][01/06/1976][]][1] 4. Sample Data (as m/d/yyyy - Default is full period): 5. sore/W Boilening Specify Boilening 5. Specify Boilening 5. specify Boilening 5. specify Boilening 5. specify Boilening	D +		3216/23/5/W/4/D0/Upper Elkhorn/Antelope/228/152-227/I/propachlor/07/15/1997/0/0.05/2/UN/G48831/56299/01/06/1976//////
4. Sample Data (as m/d/yyyy - Default is full period): 3216[32]s[15]ki/s[B8]upper Elkhorn antelope]228[152-227][1trif1tenalin]07/15/2991[0](0529)[2](0529)[3216 23 5 W 4 D0 Upper Elkhorn Antelope 228 152-227 I simazine 07/15/1997 0 0.05 2 UN 648831 56299 01/06/1976 01000
Specify Beginning Specify End Submit Clear Specify End Submit Clear			3216 23 5 W 4 D0 Upper Elkhorn Antelope 228 152-227 I trifluralin 07/15/1997 0 0.05 2 UN 648831 56299 01/06/1976 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
		Submit Clear	3095 [23]5 [W]5 [BB Upper Elkhorn Antelope 216 144-216 1 nitrate-N 07/18/1995 1.5 0.1 3 UENRD G45049 52405 10/16/1975
Date 3000 123 Fill (19 Bio logber 12 All of man and and and and and and and and and a	Date 🔤 Date		Laone Las Elule long la constant de la const





Now

Explorer 🗸	Nebrask	a Groundwater Qua	lity Clearin	ghous	e	This is a non-p	production environm	nent					C R	eset All Filters Hi
ample Result Exp	lorer			± 1	6	Мар							N 🖬	8 0 2
learinghouse Number	Sample Date	Applied Filters: Analyte/CAS #	Concentration	Units	3	QQ⊕		e Des	-2010	ale i Caller		T		/
50202	2018/12/31	nitrate-N (CAS #: 14797-55-8)	9.5	mg/L	s		1.1810.2.184	х.,	-	· ist in	and the second		mark /	
50200	2018/12/31	nitrate-N (CAS #: 14797-55-8)	5.2	mg/L	5	1993	friend and a second second	1 A	. S.	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			SMUR City	
50192	2018/12/31	nitrate-N (CAS #: 14797-55-8)	0	mg/L	с					1.1.1.1		and good and		
50186	2018/12/31	nitrate-N (CAS #: 14797-55-8)	0	mg/L	с	Minte				2. 19	1			1 A
57789	2018/12/26	nitrate-N (CAS #: 14797-55-8)	0	mg/L	c					· · · · · · · · · · · · · · · · · · ·	1			12
50230	2018/12/26	nitrate-N (CAS #: 14797-55-8)	0	mg/L	c	2							16.22	2
51936	2018/12/20	nitrate-N (CAS #: 14797-55-8)	1.89	mg/L	1	and a			······································	- 11 C	15.00		Mar Ma	30
51932	2018/12/20	nitrate-N (CAS #: 14797-55-8)	9.23	mg/L	s	19.33	AT A CARL	. · · · ·	North	S	F. 6. 19.		open 18	92.
40103	2018/12/20	nitrate-N (CAS #: 14797-55-8)	2.66	mg/L	2		the state of the second s	St Transformer	Ma diatie	14.57	A Same and			Omeha
40033	2018/12/20	nitrate-N (CAS #: 14797-55-8)	9.39	mg/L	S	nne	Caller and the state	1. 1.5. 1.5.	in the second	for infines		ST - A VAR	1. A. A.	5.
65586	2018/12/19	nitrate-N (CAS #: 14797-55-8)	0.6	mg/L	6		1	2.1880			112-1			1
65573	2018/12/19	nitrate-N (CAS #: 14797-55-8)	1.7	mg/L	1		(Service -			Stense.	a left of		
02152	2018/12/18	nitrate-N (CAS #: 14797-55-8)	0	mg/L	c	to a st	/	La Anni	A DA	1-22	ter.		the state of the s	St. ree
70016	2018/12/18	nitrate-N (CAS #: 14797-55-8)	1.3	mg/L	1			in the	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	11-18- T	<u></u>			
65593	2018/12/18	nitrate-N (CAS #: 14797-55-8)	17	mg/L	1	1.			Sec. a		and a ball the	and the second	2.4.1.1.2	OpenStreetMap control
65578	2018/12/18	nitrate-N (CAS #: 14797-55-8)	2.7	mg/L	2							~		- Conconstrainty contra
40019	2018/12/18	nitrate-N (CAS #: 14797-55-8)	8.27	mg/L	8	Well Explorer								主
6764	2018/12/18	nitrate-N (CAS #: 14797-55-8)	9.68	mg/L	s					Applied Filters:				
6739	2018/12/18	nitrate-N (CAS #: 14797-55-8)	14.1	ma/L	1*	Clearinghouse Number	DNR Registration Number	DNR Well ID	Well Type	County	NRD	Township Range Section	Latitude (NAD83)	Longitude (NAD83
		>> 464149 Total Results P	age 1 of 9283			3	G80540	89196	Irrigation	Adams	Little Blue	7NJ9WJ22	40.5642650929	-98.330777612
						<u>0</u>	G80920	89576	Irrigation	Adams	Little Blue	7N[10W]7	40.58617	-98,48253
	Go to page:	1 Show 50	~			9	601130	7/21/2010/8						
VIVIV.						1	G81130	89785	Domestic	Adams	Little Blue	7N(10W)5	40.59894	-98.46106





Before

- Microsoft Access database
- Antiquated User Interface
- No data visualization
- Manual data quality assurance
- Manual posting of approved data to website
- Not structured for USGS Groundwater Monitoring Network participation





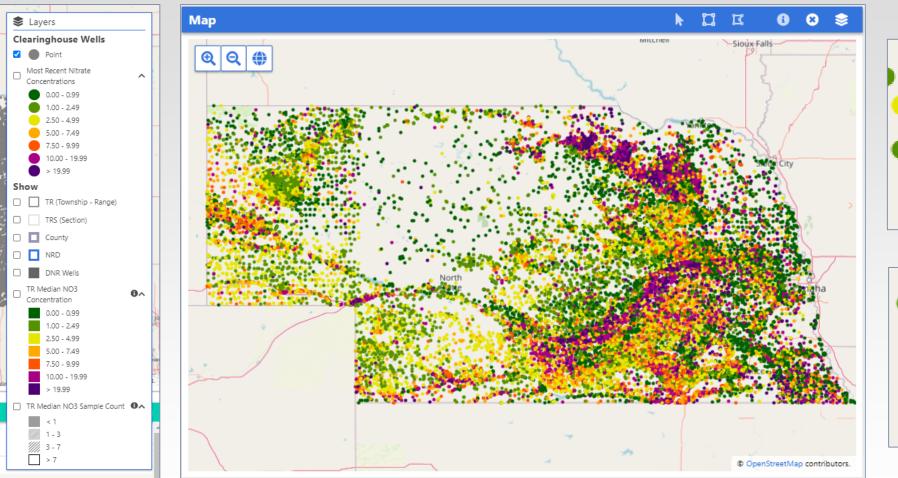
Now

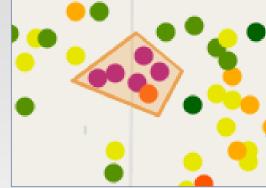
- SQL Server database
- View, download, and interact with sampled wells and sample results
- GIS component
- Electronic data submission with front-end validation checks
- Manage Sample Result submissions
- Manage access to confidential data
- Structured to participate in the USGS NGWMN

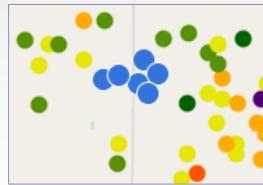










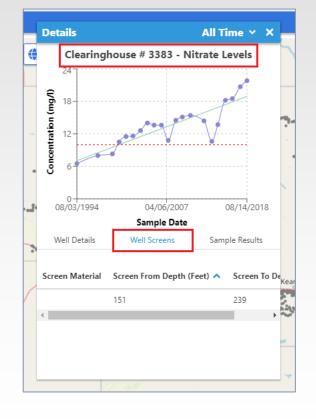






Details

- Pop-up menu for viewing individual well and sample result details
- NE specific requirements for:
 - Nitrate Chart
 - Wells Screens



Well Details	Well Screens	Sample Results
Well	Locati	on
Clearinghouse Nu 3383	-	Antelope pper Elkhorn
DNR Registration G53283		p Range Section:
DNR Well ID: 608 Well Type: Irrigat	Latitude	(NAD83): 1564008
Well Depth (Feet): Completion Date: 1976/10/27	2	le (NAD83): 0852139
DNR Link: View		
Aquifer		
Local Aquifer: National Aquifer:		
Sample Coun	: 21	
Last Sample [ate: 2018/08/14	
Most Recent	Pesticide Sample	• Date: None
Nitrate Overv	iew	
Min: 6.5	Max: 21	.8
Mean: 13.52	Median:	13.6

Well Details	Well Screens	Samj	ple Results
Sample Date 💙	Analyte/CAS #		Concentra
2018/08/14	nitrate-N (CAS #: 1479	7-55-8)	21.8
2017/09/06	nitrate-N (CAS #: 1479	7-55-8)	20.7
2016/07/20	nitrate-N (CAS #: 1479	7-55-8)	18.5
2015/07/29	nitrate-N (CAS #: 1479	7-55-8)	18.2
2014/07/02	nitrate-N (CAS #: 1479	7-55-8)	13.7
2013/08/26	nitrate-N (CAS #: 1479	7-55-8)	10.6
2012/07/16	nitrate-N (CAS #: 1479	7-55-8)	14.4
2010/08/16	nitrate-N (CAS #: 1479	7-55-8)	15.4





Well Explorer

- Dual-component menu for Well records
 - Well List
 - Well Filter: Well Detail, Location, and Lat/Long

Fort Collins Boulder								© OpenStreetM CSV
Well Explorer								≢ ₿
				Applied Filters:				1
Clearinghouse Number	DNR Registration Number	DNR Well ID	Well Type	County	NRD	Township Range Section	Latitude (NAD83)	Longitude (NAD83)
3	G80540	89196	Irrigation	Adams	Little Blue	7N 9W 22	40.5642650929	-98.330777612
<u>6</u>	G80920	89576	Irrigation	Adams	Little Blue	7N 10W 7	40.58617	-98.48253
Z	G81130	89785	Domestic	Adams	Little Blue	7N 10W 5	40.59894	-98.46106
9	G81236	89891	Irrigation	Adams	Little Blue	5N 11W 23	40.3903422954573	-98.5202460696071
17	G81980	91142	Irrigation	Adams	Little Blue	6N 11W 10	40.4989426139	-98.5393915585
<u>19</u>	G82032	91229	Domestic	Adams	Little Blue	7N 10W 5	40.59894	-98.46106
20	G81933	91067	Domestic	Adams	Little Blue	7NJ10WJ5	40.59894	-98.46106





Sample Result Explorer

- Dual-component menu for Sample Result records
 - Sample Result List
 - Sample Result Filter: Analyte, Sample Detail, Analytical Methods, and Maximum Contaminant Level (MCL)

Explorer 🗸	xplorer V Nebraska Groundwater Quality Export Sample Result I											
Sample Result Expl	lorer			≢ ₿	Мар							
Clearinghouse Number	Sample Date	Applied Filters: Analyte/CAS #	Concentration	Units	ଢ଼ୣ							
250202	2018/12/31	nitrate-N (CAS #: 14797-55-8)	9.5	mg/L								
250200	2018/12/31	nitrate-N (CAS #: 14797-55-8)	5.2	mg/L	. 6							
250192	2018/12/31	nitrate-N (CAS #: 14797-55-8)	0	mg/L								
250186	2018/12/31	nitrate-N (CAS #: 14797-55-8)	0	mg/L								
257789	2018/12/26	nitrate-N (CAS #: 14797-55-8)	0	mg/L	52							
250230	2018/12/26	nitrate-N (CAS #: 14797-55-8)	0	mg/L	X							
<u>151936</u>	2018/12/20	nitrate-N (CAS #: 14797-55-8)	1.89	mg/L								





Phase 2 Enhancements

Module	What	Description
GIS	Thematic Maps	Animated maps showing parameter results over time
GIS	Measure Distance & Area	Tools to measure distance and area on the map
UI	Well Construction	Incorporate the well construction diagram
UI	Resize App Components	Ability for users to resize the view of app components
Submission	Alerts	Automated alerts to agency users for flagged results (e.g. exceeds limit)
Submission	Machine-Compiled EDDs	Assist in creation of machine compiled Electronic Data Deliverables
Reporting	Compare Functionality	Select a set of records to compare across components
Reporting	Dashboard	High-level, aggregate data visually represented
Data	Download	Allow users to select specific datasets for download
Data	Public Water Supply Data	Add public water supply data, but omit/obscure location data in map





Technology

Frontend

- Javascript React App
- API
- ASP.NET core (C#)
- Database
- SQL Server





Phase 1 Production Applications





Wyoming DEQ RBDMS Environmental

The RBDMS Environmental application:

- Is currently being updated to reflect the new WaterSTAR development in NE.
- Is used to view multiple internal and intra-agency datasets.
- Can accept EDD uploads and validate data.
- Has a robust reporting menu.
- Has administrator menus for managing roles, data, and application menus.





Facility Explorer

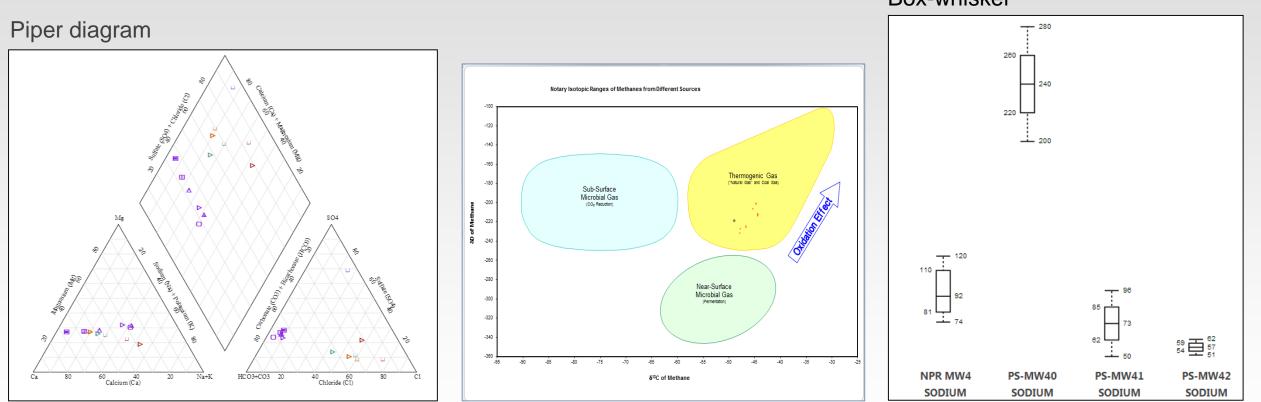
• With multiple datasets for searching and data analysis.

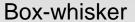
🙆 B	rowse Facilitie	S 🗸		Use Gis Selection	Νο				
Facility	List Reports Map	Help		Facility Name					
Select	Facility Name	Facility Type	Latitude83	Agency		Clear	Range Dir	Agency Su	b Agency Project ID
	USGS-410025108143501	GW	41.0069	Sub-Agency	Coal Bed methane	Clear		NWIS	Unk
	USGS-410042108162301	GW	41.0116	Project Name	GEM			NWIS	Unk
	USGS-410108104223501	GW	41.0154		NWIS Storage Tank Program			NWIS	Unk
	USGS-410111108072801	GW	41.0187	Facility Type - GW	Land Quality Division			NWIS	Unk
	USGS-410121107565001	GW	41.0225	Township	RBDMS GW Warehouse			NWIS	Unk
	USGS-410135107265701	GW	41.0262					NWIS	Unk
	USGS-410156104242901	GW	41.0322	Township Dir.				NWIS	Unk
	USGS-410202108124601	GW	41.0340	Range				NWIS	Unk
	USGS-410208107392801	GW	41.0356	Range Dir.				NWIS	Unk
	USGS-410218104184301	GW	41.0383					NWIS	Unk
	USGS-410233104093201	GW	41.0424	Parameter Search	NITRATE			NWIS	Unk
	USGS-410233104093202	GW	41.0425	Parameter Limit	0.05			NWIS	Unk
	USGS-410233104093203	GW	41.0426	Save Filter Name	Shared			NWIS	Unk
	USGS-410241110523801	GW	41.0447	Save Filter Name		ve Filter		NWIS	Unk
				Select Facilities	Clear Cancel	J	ect All Unselect		Logout:DataAdministrator





Reporting Output Examples









EDD Upload Menu

🖲 EDD l	Jploads 🗸											
Delete	EDD Files											
Validate	Name					Key	Create User	Status		Modify D	ate	
Accept	No items EDD Messages											
DD Filter	Table	**	Column ≎≑	Row <	•		Messa	ige			≎∳ Seve	erity ᅌ
	No data available	in table										
Status	Showing 0 to 0 of 0) entries										
Pending												
Accepted Rejected												
erified												
rt Date												
8/18/2020												
d Date												
me												
psed Time (msec)												
							(+)		\bigcirc	\bigcirc	\oslash	€
							Add	Export Messages	Export File	Find Analysis	Edit User	Logo





Geological Survey of Alabama RBDMS Environmental

- The RBDMS Environmental application serves the GSA goal of evaluating ground water development and the impacts of current production by determining:
- Where the water exists.
- How much water is in storage.
- How much active recharge is occurring.
- How much water is being used.
- What the impacts of the usage are.





Colorado OGCC RBDMS Environmental

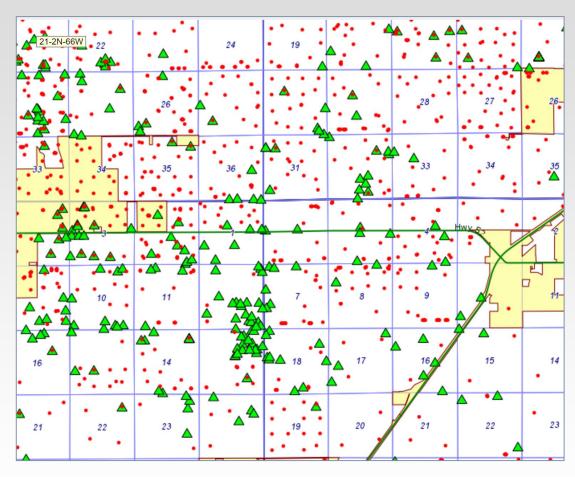
The RBDMS Environmental application:

- Is used to track pre and post hydraulic fracturing water quality monitoring.
- Can accept EDD uploads and validate data.
- Has administrator menus for managing roles, data, and application menus.





Colorado OGCC RBDMS Environmental



COGIS - Environmental Sample Site Information

				-	
				Doc	GIS
#705573 Information					
Sample Site ID:	705573				
FacilityType:	DOM	ProjNumber:			
County:	WELD - #123	Location:	NWSW 25 2N 66W		
Elevation:	0	Lat/Long:	40.109/-104.73442		
DWR Receipt #:		WellDepth:	700		

COGCC Water Quality Database Disclaimer:

The analytical data and other information in this database are a compilation of data collected by COGCC staff, data submitted to COGCC from a variety of third parties, and historical data. All analytical data collected by or submitted to the COGCC is public information and COGCC posts the data to this database as a public service. The data is provided for informational purposes only. COGCC does not conduct a detailed review of quality control/quality assurance protocols, chain of custody procedures, or field or laboratory methodologies on data received from third parties. The level of review performed on historical data is unknown. COGCC cont explainly perform formal data validation for any of the data posted to this database. The COGCC makes no warranties or representations of any kind, express or implied, regarding the quality, accuracy, reliability, merchantability, or fitness for a particular purpose of the data provided herein.

						Sample(s)			
All Export to	CSV								
Sample ID:	535901	Sample Date:	11/6/2013	Matrix:	GAS	Collection Point: Dom	Type: dom	Lab:	Dolan Integration Group
Sample ID:	535790	Sample Date:	11/6/2013	Matrix:	WATER	Collection Point: Dom	Type: Dom	Lab:	ALS Lab Group (formerly Paragon)
Sample ID:	535792	Sample Date:	11/6/2013	Matrix:	WATER	Collection Point: Dom	Type: Dom	Lab:	ALS Lab Group (formerly Paragon)
Sample ID:	464275	Sample Date:	11/10/2008	Matrix:	GAS	Collection Point:	Туре:	Lab:	Isotech Laboratories
Sample ID:	464276	Sample Date:	11/10/2008	Matrix:	WATER	Collection Point:	Type:	Lab:	Evergreen Analytical, Inc.

COGCC makes no warranties or representations of any kind, express or implied, regarding the quality, accuracy, reliability, merchantability, or fitness for a partic the data provided herein.

	Sample(s)								
All Export to CSV									
Sample ID:	535901	Sample Date:	11/6/2013	Matrix:	GAS	Collection Point: Dom		Type: dom	Lab: Dolan Integra
	Samp	ele Results for Sample # 5	35901 Dolan Integratio	n Group ID: DIC	G-004237	- Minimize			
Methodcode	ParamDescription		ResultValue	Units		DetectionLimit	Qualifier		
SOP	BUTANE	BUTANE		MOL %		0.005			
SOP	C6+ (hexanes +	+)	ND	MOL %		0.005	ND		
SOP	CARBON DIOX	CARBON DIOXIDE		MOL %		0.005			
SOP	DELTA 13C C1	DELTA 13C C1		per mil VPDB					
SOP	DELTA D C1		-269	per mil					
SOP	ETHANE		0.2	MOL %		0.005			
SOP	Helium		22.33	MOL %		0.01			
SOP	HYDROGEN		ND	MOL %		0.01	ND		
SOP	ISOBUTANE	ISOBUTANE		MOL %		0.005			
SOP	ISOPENTANE		ND	MOL %		0.005	ND		
SOP	METHANE		34.1	MOL %		0.005			
SOP	NITROGEN (N	NITROGEN (N2)		MOL %		0.005			
SOP	OXYGEN + AR	OXYGEN + ARGON		MOL %		0.005			
SOP	PENTANE	PENTANE		ND MOL %		0.005	ND		
SOP	PROPANE		0.09	MOL %		0.005			
Sample ID:	535790	Sample Date:	11/6/2013	Matrix:	WATER	Collection Point: Dom		Type: Dom	Lab: ALS Lab Gro
Sample ID:	535792	Sample Date:	11/6/2013	Matrix:	WATER	Collection Point: Dom		Type: Dom	Lab: ALS Lab Gro
Sample ID:	464275	Sample Date:	11/10/2008	Matrix:	GAS	Collection Point:		Type:	Lab: Isotech Labo
Sample ID:	464276	Sample Date:	11/10/2008	Matrix:	WATER	Collection Point:		Type:	Lab: Evergreen Ar





RBDMS WaterSTAR

www.rbdms.org

