

Excel for Hydrology

Section 3



Text and Logic Functions

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03_Text+Logic_Functions

Text manipulation is convenient for automating labelling and is necessary many logical tests. Basic text functions are introduced in this section.

01_TextManipulate.xlsx – Basic functions

<p>LEFT</p> <p>Sample N leftmost characters from number or a text string. Converts numbers to text.</p>	<table border="1"> <thead> <tr> <th>SiteID</th> <th>USGSname</th> <th>xxx</th> <th>LEFT</th> </tr> </thead> <tbody> <tr> <td>370806116264001</td> <td>UE-18r</td> <td></td> <td>=LEFT(\$A6,\$D\$3)</td> </tr> <tr> <td>371608116191007</td> <td>UE-19c WW</td> <td></td> <td>371608</td> </tr> </tbody> </table>	SiteID	USGSname	xxx	LEFT	370806116264001	UE-18r		=LEFT(\$A6,\$D\$3)	371608116191007	UE-19c WW		371608								
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371608116191007	UE-19c WW		371608																		
<p>VALUE</p> <p>Converts text to numeric value if text can be interpreted as a number.</p>	<table border="1"> <thead> <tr> <th>USGSname</th> <th>xxx</th> <th>LEFT</th> <th>Value-function</th> </tr> </thead> <tbody> <tr> <td>UE-18r</td> <td></td> <td>370806</td> <td>=VALUE(D6)</td> </tr> <tr> <td>UE-19c WW</td> <td></td> <td>371608</td> <td>371608</td> </tr> </tbody> </table>	USGSname	xxx	LEFT	Value-function	UE-18r		370806	=VALUE(D6)	UE-19c WW		371608	371608								
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UE-19c WW		371608	371608																		
<p>Any math operation, + - / *, converts text to numeric value if text can be interpreted as a number.</p>	<table border="1"> <thead> <tr> <th>LEFT</th> <th>Value-function</th> <th>value * 1</th> </tr> </thead> <tbody> <tr> <td>370806</td> <td>370806</td> <td>=D6*1</td> </tr> <tr> <td>371608</td> <td>371608</td> <td>371608</td> </tr> </tbody> </table>	LEFT	Value-function	value * 1	370806	370806	=D6*1	371608	371608	371608											
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<p>LEN</p> <p>Returns number of characters in a string.</p>	<table border="1"> <thead> <tr> <th>USGSname</th> <th>xxx</th> <th>LEFT</th> <th>Value-function</th> <th>value * 1</th> <th>LEN</th> </tr> </thead> <tbody> <tr> <td>UE-18r</td> <td></td> <td>370806</td> <td>370806</td> <td>370806</td> <td>=LEN(B6)</td> </tr> <tr> <td>UE-19c WW</td> <td></td> <td>371608</td> <td>371608</td> <td>371608</td> <td></td> </tr> </tbody> </table>	USGSname	xxx	LEFT	Value-function	value * 1	LEN	UE-18r		370806	370806	370806	=LEN(B6)	UE-19c WW		371608	371608	371608			
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UE-19c WW		371608	371608	371608																	
<p>FIND</p> <p>Reports position of first character or substring being sought in a string.</p> <p>For example, “(“ is the 8th character in the string “UE-19h (2321-3705 ft).”</p>	<table border="1"> <thead> <tr> <th>USGSname</th> <th>xxx</th> <th>F I N D</th> <th>find</th> </tr> </thead> <tbody> <tr> <td>UE-18r</td> <td></td> <td>3: # # 6</td> <td>#VALUE! #\</td> </tr> <tr> <td>UE-19c WW</td> <td></td> <td>3: # # 9</td> <td>#VALUE! #\</td> </tr> <tr> <td>UE-19e WW</td> <td></td> <td>3: # # 9</td> <td>#VALUE! #\</td> </tr> <tr> <td>UE-19h (2321-3705 ft)</td> <td></td> <td>3: # # #</td> <td>=FIND("(", \$B9)</td> </tr> </tbody> </table>	USGSname	xxx	F I N D	find	UE-18r		3: # # 6	#VALUE! #\	UE-19c WW		3: # # 9	#VALUE! #\	UE-19e WW		3: # # 9	#VALUE! #\	UE-19h (2321-3705 ft)		3: # # #	=FIND("(", \$B9)
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UE-19e WW		3: # # 9	#VALUE! #\																		
UE-19h (2321-3705 ft)		3: # # #	=FIND("(", \$B9)																		

MID

Sample from a user specified position a given number of characters. Converts numbers to text.

For example, Sampling 99 characters starting with the 8th character in the string “UE-19h (2321-3705 ft)” returns “(2321-3705 ft)”.

	USGSname	xxx	F	I	N	find	mid
5							
6	UE-18r		3	#	#	6 #VALUE!	#VALUE!
7	UE-19c WW		3	#	#	9 #VALUE!	#VALUE!
8	UE-19e WW		3	#	#	9 #VALUE!	#VALUE!
9	UE-19h (2321-3705 ft)		3	#	#	8	=MID(\$B9,\$H9,99)

RIGHT

Sample N rightmost characters from number or a text string. Converts numbers to text.

	USGSname	xxx	F	I	N	find	right	Depth range
5								
6	UE-18r		3	#	#	6 #VALUE!	#VALUE!	Not specified
7	UE-19c WW		3	#	#	9 #VALUE!	#VALUE!	Not specified
8	UE-19e WW		3	#	#	9 #VALUE!	#VALUE!	Not specified
9	UE-19h (2321-3705 ft)		3	#	#	8	=RIGHT(\$B9,LEN(\$B9)-\$H9+1)	

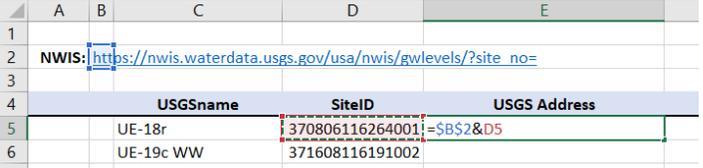
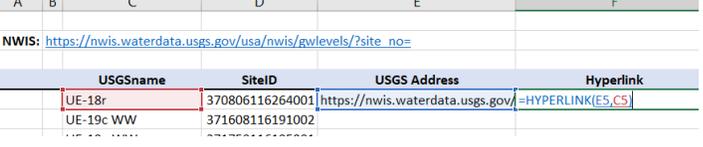
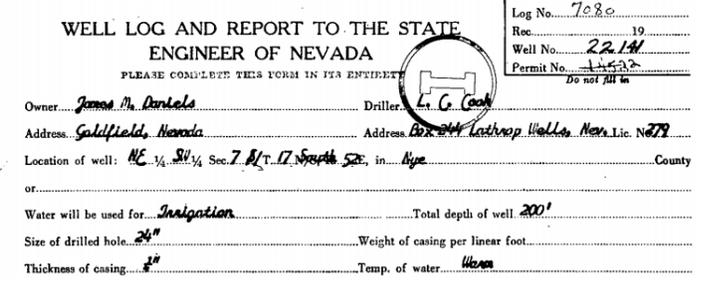
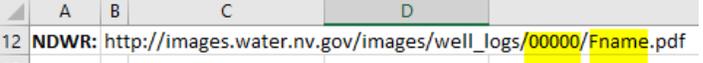
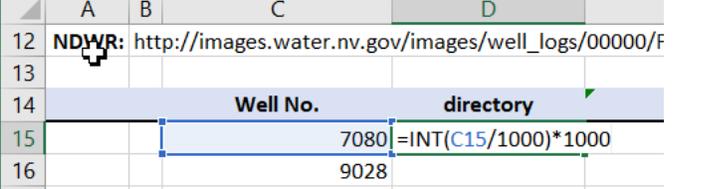
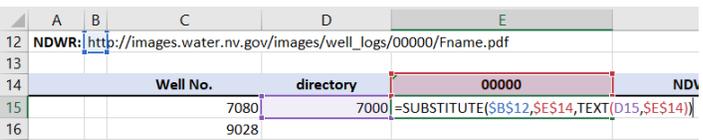
IF and ISNUMBER

Capture errors with ISNUMBER function and return alternative result rather than an error such as “#VALUE!”.

	USGSname	xxx	F	I	N	find	right	Depth range
5								
6	UE-18r		3	#	#	6 #VALUE!	#VALUE!	Not specified
7	UE-19c WW		3	#	#	9 #VALUE!	#VALUE!	Not specified
8	UE-19e WW		3	#	#	9 #VALUE!	#VALUE!	
9	UE-19h (2321-3705 ft)		3	#	#	8	=IF(ISNUMBER(H8),I8,\$K\$3)	

Building and activating hyperlinks makes basic data more accessible and verifies site existence. Hyperlinks are created for USGS groundwater data and NDWR well logs in the following example.

01_TextManipulate.xlsx – Text and hyperlinks

<p>Hyperlinks to USGS for groundwater levels in NWIS use "https://nwis.waterdata.usgs.gov/usa/nwis/gwlevels/?site_no=" and the 15-digit site identifier.</p> <p>Build the address with "$=\&B\&2\&D5$" where & concatenates text strings.</p>	 <table border="1"> <thead> <tr> <th>USGSname</th> <th>SiteID</th> <th>USGS Address</th> </tr> </thead> <tbody> <tr> <td>UE-18r</td> <td>370806116264001</td> <td>$=B5\&2\&D5$</td> </tr> <tr> <td>UE-19c WW</td> <td>371608116191002</td> <td></td> </tr> </tbody> </table>	USGSname	SiteID	USGS Address	UE-18r	370806116264001	$=B5\&2\&D5$	UE-19c WW	371608116191002				
USGSname	SiteID	USGS Address											
UE-18r	370806116264001	$=B5\&2\&D5$											
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<p>URL is converted to an active link with $=HYPERLINK(E5,\&C5)$, where first entry is address and second entry is more readable text to display.</p>	 <table border="1"> <thead> <tr> <th>USGSname</th> <th>SiteID</th> <th>USGS Address</th> <th>Hyperlink</th> </tr> </thead> <tbody> <tr> <td>UE-18r</td> <td>370806116264001</td> <td>https://nwis.waterdata.usgs.gov/</td> <td>$=HYPERLINK(E5,C5)$</td> </tr> <tr> <td>UE-19c WW</td> <td>371608116191002</td> <td></td> <td></td> </tr> </tbody> </table>	USGSname	SiteID	USGS Address	Hyperlink	UE-18r	370806116264001	https://nwis.waterdata.usgs.gov/	$=HYPERLINK(E5,C5)$	UE-19c WW	371608116191002		
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<p>Addresses for well logs from NDWR are more complex because PDFs are stored in subfolders for every 1000 logs.</p> <p>For example, http://images.water.nv.gov/images/well_logs/07000/7080.pdf</p> <p>Well log 7080 is in subfolder 07000.</p>	 <p>WELL LOG AND REPORT TO THE STATE ENGINEER OF NEVADA PLEASE COMPLETE THIS FORM IN ITS ENTIRETY</p> <p>Owner: James M. Daniels Driller: G. Cook Address: Galifield, Nevada Address: Box 244, Lathrop Wells, Nev. Lic. No. 279 Location of well: 1/4 SW 1/4 Sec. 7, T. 17, S. 20, in Nye County Water will be used for: Irrigation Total depth of well: 200' Size of drilled hole: 24" Weight of casing per linear foot: Thickness of casing: 5" Temp. of water: 46.0</p>												
<p>Root address for NDWR in cell B12 where subfolder and name generalized to 00000 and Fname which created and replaced for each well log.</p>													
<p>Calculate subdirectory in C15 with $=INT(C15/1000)*1000$.</p>	 <table border="1"> <thead> <tr> <th>Well No.</th> <th>directory</th> </tr> </thead> <tbody> <tr> <td>7080</td> <td>$=INT(C15/1000)*1000$</td> </tr> <tr> <td>9028</td> <td></td> </tr> </tbody> </table>	Well No.	directory	7080	$=INT(C15/1000)*1000$	9028							
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9028													
<p>Substitute 00000 with subfolder in $=SUBSTITUTE(\&B\&12,\&E\&14,TEXT(\&D15,\&E\&14))$</p> <p>Subfolder 07000 was converted to text with format 00000 so that leading zero was added.</p>	 <table border="1"> <thead> <tr> <th>Well No.</th> <th>directory</th> <th>00000</th> <th>NDWR</th> </tr> </thead> <tbody> <tr> <td>7080</td> <td>7000</td> <td>$=SUBSTITUTE(B12,E14,TEXT(D15,E14))$</td> <td></td> </tr> <tr> <td>9028</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Well No.	directory	00000	NDWR	7080	7000	$=SUBSTITUTE(B12,E14,TEXT(D15,E14))$		9028			
Well No.	directory	00000	NDWR										
7080	7000	$=SUBSTITUTE(B12,E14,TEXT(D15,E14))$											
9028													

Substitute **Fname** with well log no. in
 =SUBSTITUTE(E15,F\$13,TEXT(C15,"0"))
 Modified address in cell E15 is referenced
 instead of root address for NDWR in cell B12.

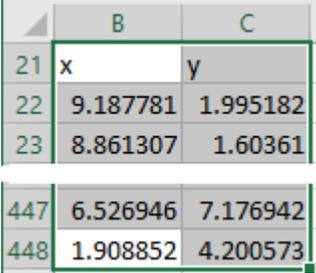
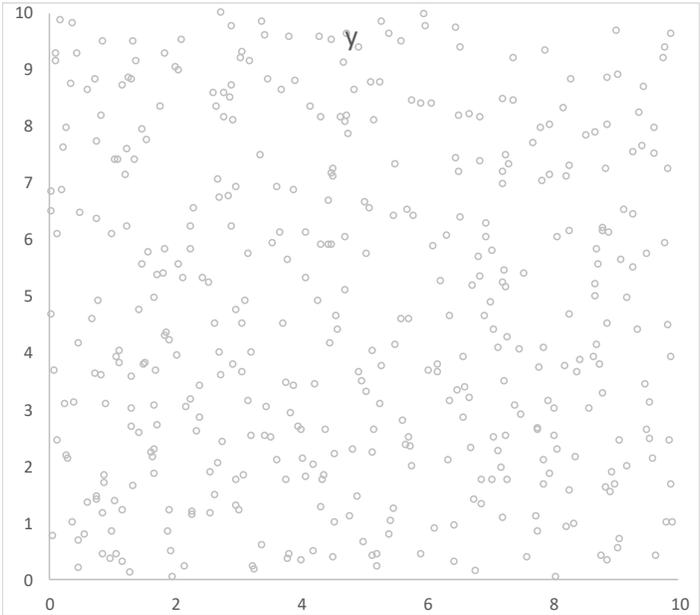
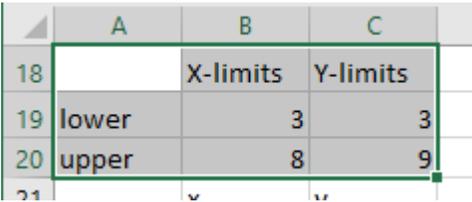
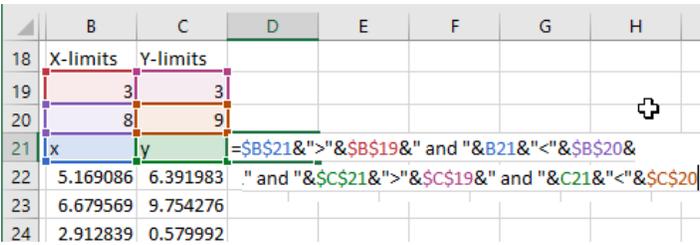
	C	D	E	F
14	Well No.	directory	00000	NDWR address
15	7080	7000	http://images.w	=SUBSTITUTE(F15,"Fname",C15)
16	7080			

URL is converted to an active link with
 =HYPERLINK(F15,C15), where first entry is
 address and second entry is more readable
 text to display.

B	C	D	E	F	G	H
	Well No.	directory	00000	NDWR address	Hyperlink	
	7080	7000	http://images.w	http://images.water.nv.gov/imag	=HYPERLINK(F15,C15)	
	7080					

Bound range of plotted points with IF and AND functions.

02_IFplus.xlsx – Apply logic functions

<p>Highlight range B21:C448.</p>	 <table border="1"> <thead> <tr> <th></th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>21</td> <td>x</td> <td>y</td> </tr> <tr> <td>22</td> <td>9.187781</td> <td>1.995182</td> </tr> <tr> <td>23</td> <td>8.861307</td> <td>1.60361</td> </tr> <tr> <td>447</td> <td>6.526946</td> <td>7.176942</td> </tr> <tr> <td>448</td> <td>1.908852</td> <td>4.200573</td> </tr> </tbody> </table>		B	C	21	x	y	22	9.187781	1.995182	23	8.861307	1.60361	447	6.526946	7.176942	448	1.908852	4.200573																																														
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<p>Insert a XY scatter plot.</p> <p>Fix X and Y axes to range from 0 to 10.</p> <p>Set markers to size 4 open circles with grey outlines.</p>																																																																	
<p>Define limits for X and Y values to plot in a new series.</p>	 <table border="1"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>18</td> <td></td> <td>X-limits</td> <td>Y-limits</td> </tr> <tr> <td>19</td> <td>lower</td> <td>3</td> <td>3</td> </tr> <tr> <td>20</td> <td>upper</td> <td>8</td> <td>9</td> </tr> </tbody> </table>		A	B	C	18		X-limits	Y-limits	19	lower	3	3	20	upper	8	9																																																
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<p>Define heading in cell D21, =\$B\$21 > "&\$B\$19&" and "&B21 < "&\$B\$20&" and "&\$C\$21 > "&\$C\$19&" and "&C21 < "&\$C\$20</p>	 <table border="1"> <thead> <tr> <th></th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> <th>F</th> <th>G</th> <th>H</th> </tr> </thead> <tbody> <tr> <td>18</td> <td>X-limits</td> <td>Y-limits</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>19</td> <td>3</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>20</td> <td>8</td> <td>9</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>21</td> <td>x</td> <td>y</td> <td>= \$B\$21 > "&\$B\$19&" and "&B21 < "&\$B\$20&</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>22</td> <td>5.169086</td> <td>6.391983</td> <td>" and "&\$C\$21 > "&\$C\$19&" and "&C21 < "&\$C\$20</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>23</td> <td>6.679569</td> <td>9.754276</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>24</td> <td>2.912839</td> <td>0.579992</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		B	C	D	E	F	G	H	18	X-limits	Y-limits						19	3	3						20	8	9						21	x	y	= \$B\$21 > "&\$B\$19&" and "&B21 < "&\$B\$20&					22	5.169086	6.391983	" and "&\$C\$21 > "&\$C\$19&" and "&C21 < "&\$C\$20					23	6.679569	9.754276						24	2.912839	0.579992					
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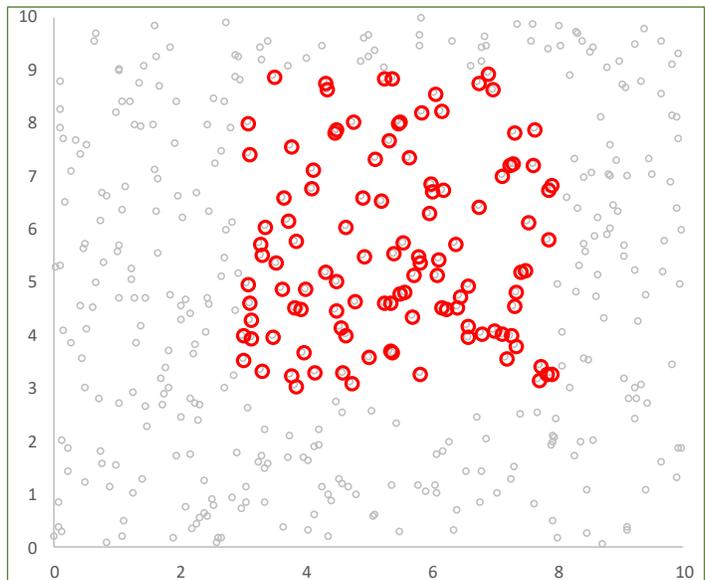
Add equation cell D22,
 $=IF(AND(\$B22>\$B\$19,\$B22<\$B\$20,\$C22>\$C\$19,\$C22<\$C\$20),\$C22,-9)$

	A	B	C	D	E	F	G	H	I	J
18		X-limits	Y-limits							
19	lower	3	3							
20	upper	8	9							
21		x	y	x>3 and x<8 and y>3 and y<9						
22		9.191685	1.655234	=IF(AND(\$B22>\$B\$19,\$B22<\$B\$20,\$C22>\$C\$19,\$C22<\$C\$20),\$C22,-9)						
23		6.847109	8.694526							

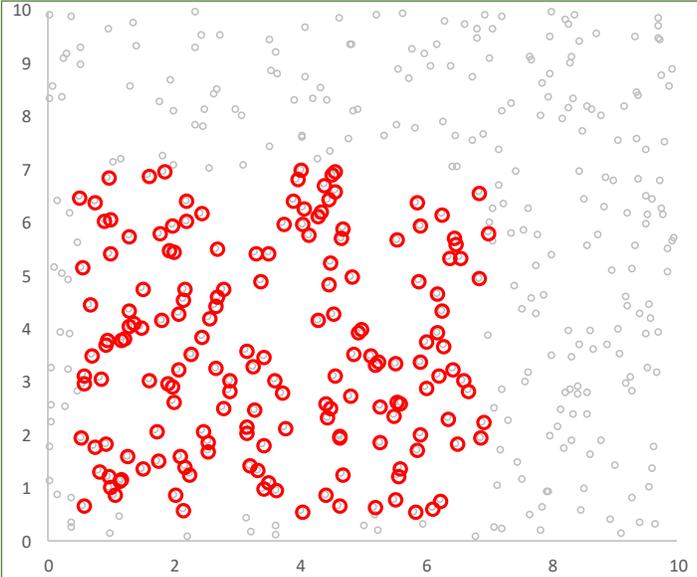
Select cell D22 and double-click lower, right corner of selected cell.

	A	B	C	D
18		X-limits	Y-limits	
19	lower	3	3	
20	upper	8	9	
21		x	y	x>3 and x<8
22		9.191685	1.655234	-9
23		6.847109	8.694526	
24		2.962313	6.398948	
25		4.744163	9.564223	
26		4.218936	8.281635	

Highlight range D21:D448.
 Add to scatter plot.
 Format series to a contrasting color.



Vary entries in range B19:C20 to test effect of IF-AND statements.



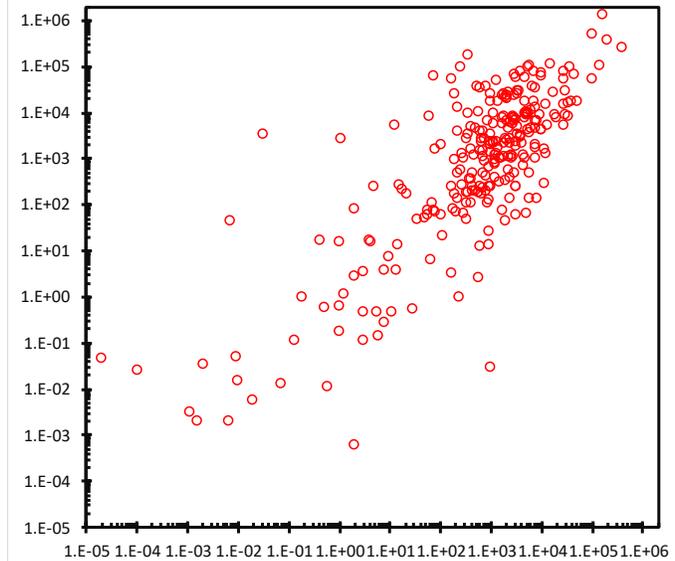
Differentiate aquifer-test results in scatter plots. Aquifer-test results and specific-capacity estimates are a basis and pumped volume is the other basis.

03_TransmissivityDV3.xlsx – Apply logic functions

Highlight range E20:F291.

Insert a XY scatter plot.

Set markers to size 5 open circles with red, 0.75 pt outlines.



Fix X and Y axes to range from 1E-5 to 2.E6.

Set scales to logarithmic.

Specify opposing axis crosses at 1.0E-9.

Format Axis

Axis Options Text Options

Axis Options

Bounds

Minimum 1.0E-5 Reset

Maximum 2.0E6 Reset

Units

Major 10.0 Auto

Minor 10.0 Auto

Horizontal axis crosses

Automatic

Axis value 1e-9

Maximum axis value

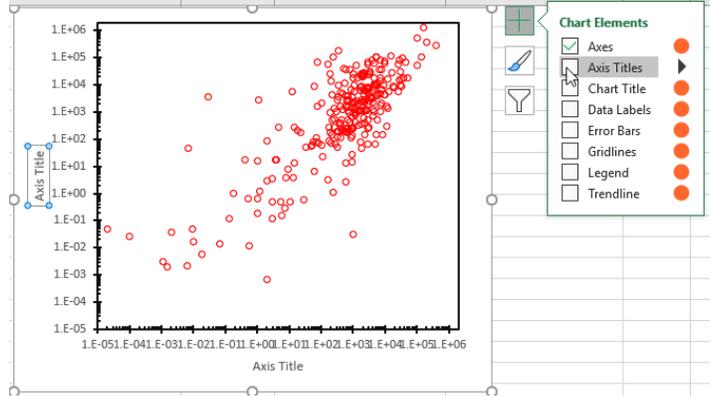
Display units None

Show display units label on chart

Logarithmic scale Base 10

Values in reverse order

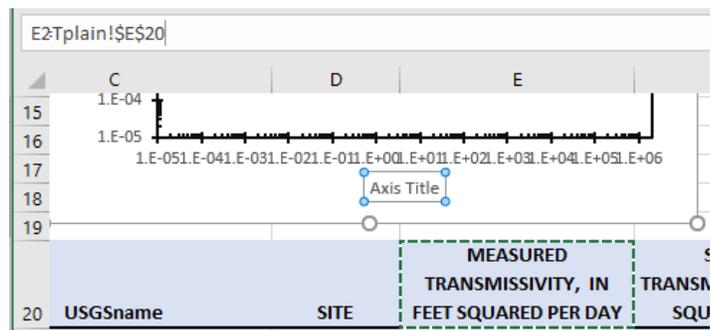
Add axis titles.



Select X-axis title.

Type = in formula bar.

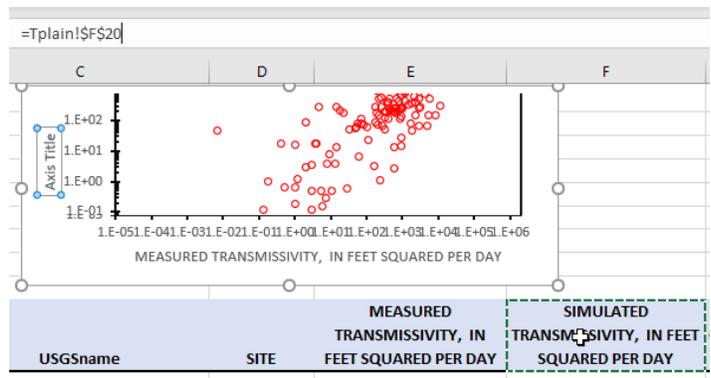
Select cell E20, MEASURED TRANSMISSIVITY, IN FEET SQUARED PER DAY, and return.



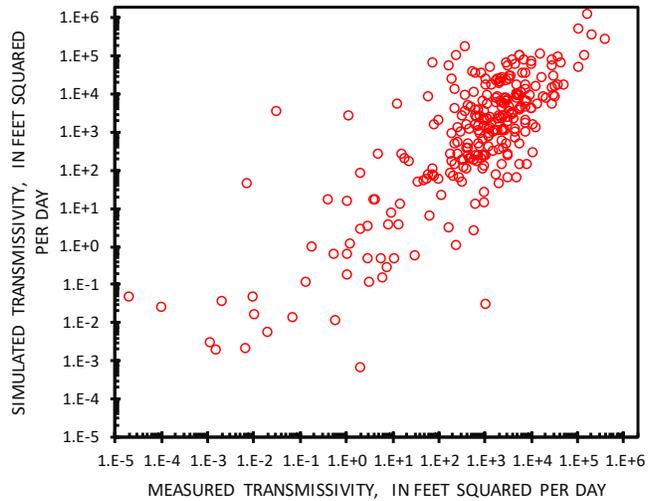
Select Y-axis title.

Type = in formula bar.

Select cell F20, SIMULATED TRANSMISSIVITY, IN FEET SQUARED PER DAY, and return.

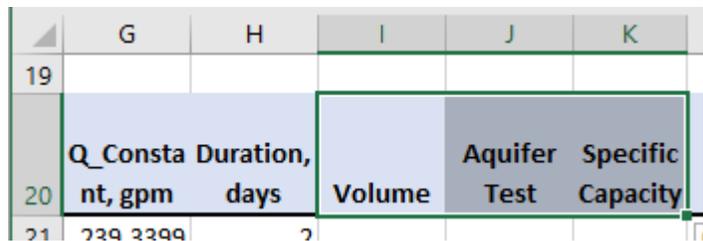


Plot shows undifferentiated measured and simulated transmissivities. Measured transmissivities are results from aquifer tests and estimates from specific capacities. Simulated transmissivities were sampled from a numerical flow model.

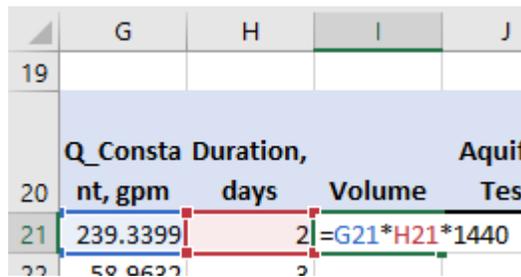


CATEGORIZE RESULTS—Aquifer test or Specific Capacity

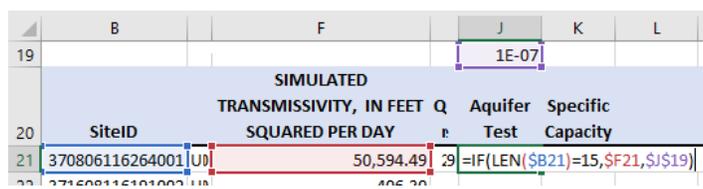
Add new columns for categorizing results.
Label headings Volume, Aquifer Test, and Specific Capacity in cells I20, J20, and K20, respectively.



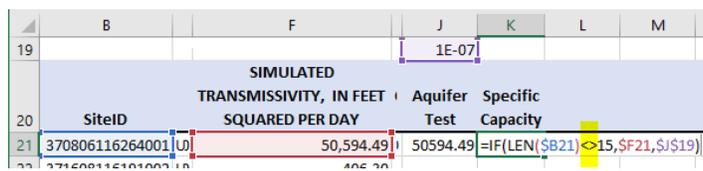
Calculate volume pumped during aquifer test in cell I21 with
 $=G21*H21*1440$
Multiplier of 1440 converts gpm to gpd.



All aquifer test results were assigned a USGS site identifier which is 15 digits.
Filter based on length of SiteID.
 $=IF(LEN(\$B21) = 15, \$F21, \$J\$19)$



NDWR well logs are all less than 15 digits.
Filter based on length of SiteID.
 $=IF(LEN(\$B21) <> 15, \$F21, \$J\$19)$
 $LEN(\$B21) < 15$ also would work.

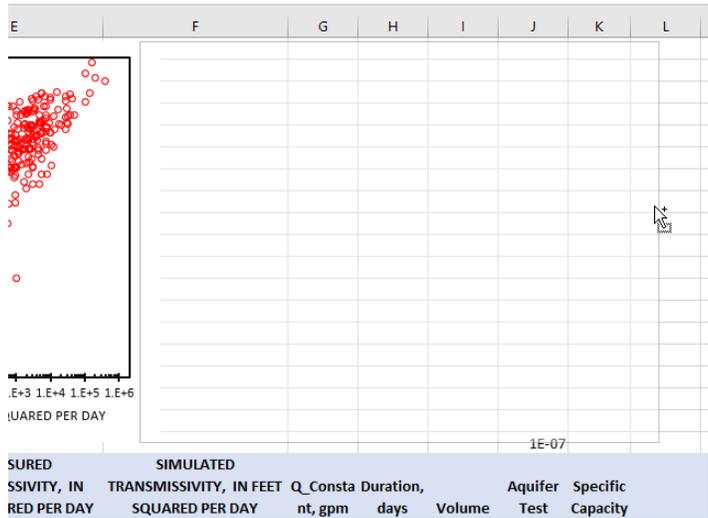


Select range I21:K21 and double-click lower, right corner of selected range.

	H	I	J	K
19			1E-07	
20	Duration,	Aquifer	Specific	
	days	Volume	Test	Capacity
21	2	689298.9	50594.49	1E-07
22	3			
23	0.145833			

Copy the chart with Ctrl+Drag.

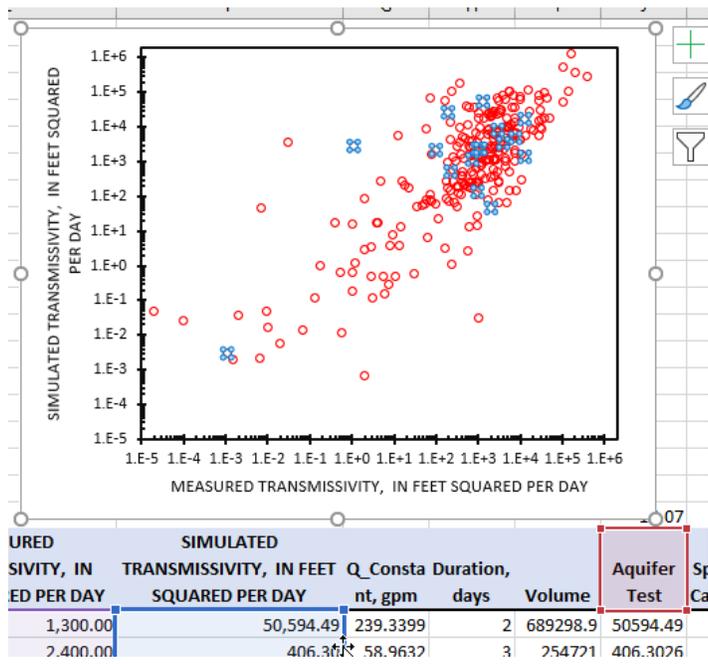
Let go of left-mouse button where you want copy.



Select series,

Grab frames around highlighted ranges and move to "Aquifer Test" heading in cell J20 and simulated transmissivities from just aquifer tests in range J21:J291.

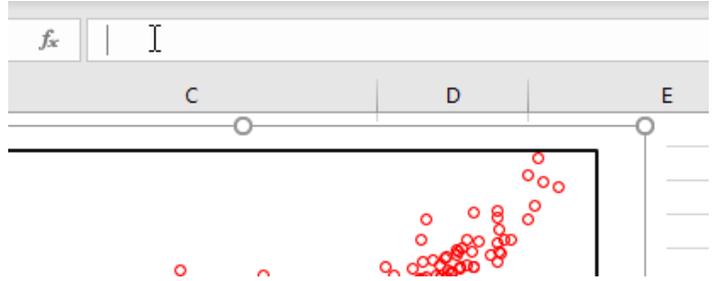
Transmissivity estimates from specific capacities were assigned 1.E-7 and do not appear on the chart.



Copy series equation from formula bar.

```
=SERIES(Tplain!$J$20,Tplain!$E$21:$E$291,Tplain!$J$21:$J$291,1)
```

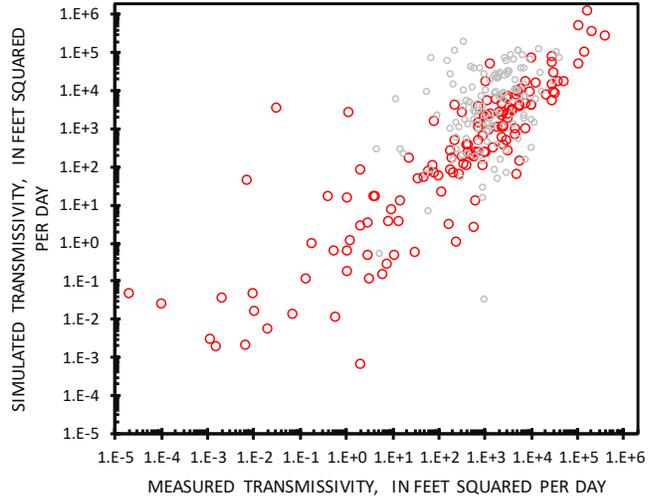
Select chart area and
Paste series equation into empty formula bar.



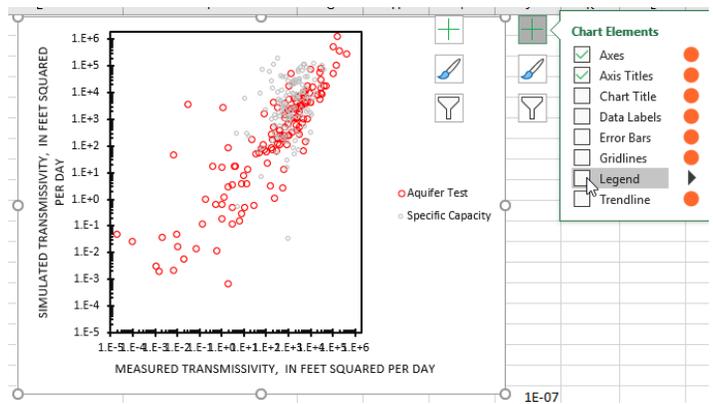
Edit **J** to **K** in pasted formula and
Change last entry (series order) from **1** to **2**.

```
=SERIES(Tplain!$K$20,Tplain!$E$21:$E$291,Tplain!$K$21:$K$291,2)
```

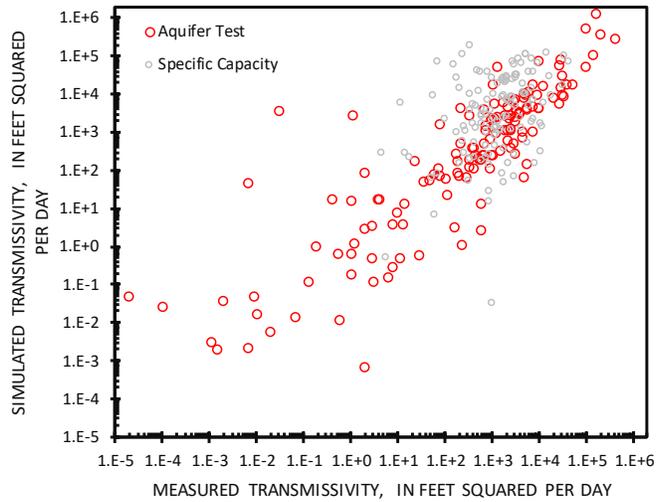
Format new series
Set marker to an unfilled, size 4 circle with a
grey outline and a line weight of 1 pt.



Add legend



Move legend and resize plot area in chart.



CATEGORIZE RESULTS—Pumped Volumes

Define bins of pumped volumes in gallons to categorize results.

Determine minimum volume pumped or displaced in cell L19.

	I	J	K	L	M	N
19		1E-07		=MIN(I21:I291)		
		Aquifer	Specific			
20	Volume	Test	Capacity			
21	689298.9	50594.49	1E-07			
22	254721	406.3026	1E-07			

Determine maximum volume pumped or displaced in cell O19.

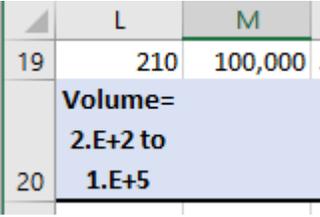
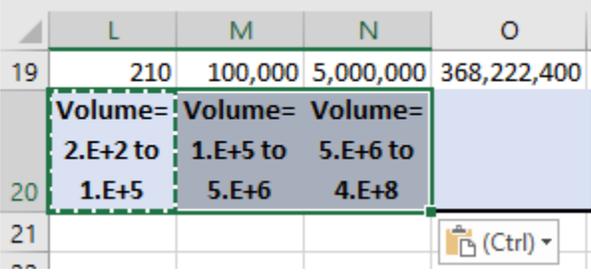
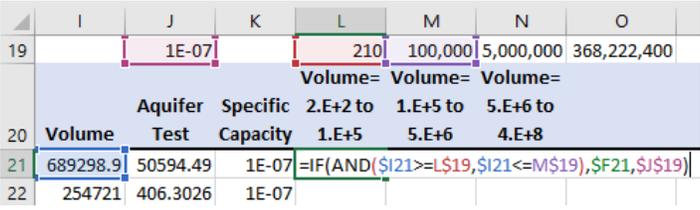
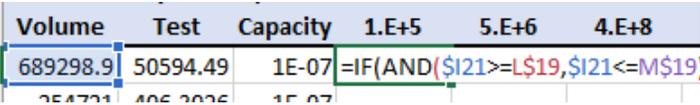
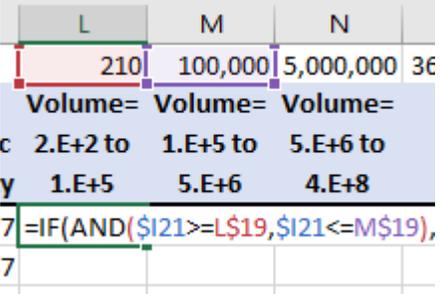
Assign breaks of 100,000 and 5,000,000 in cells M19 and N19.

	I	J	K	L	M	N	O
18	DAY						
19		1E-07		210			=MAX(I21:I291)
		Aquifer	Specific				
20	Volume	Test	Capacity				
21	689298.9	50594.49	1E-07				
22	254721	406.3026	1E-07				

Define headings with equations so that labels reflect assigned ranges.

Equation for first heading in cell L20 is =I\$20&"="&TEXT(L19,"0.E+0")&" to "&TEXT(M19,"0.E+0")

	I	J	K	L	M	N	O	P	Q
18	DAY								
19		1E-07		210	100,000	5,000,000	368,222,400		
		Aquifer	Specific						
20	Volume	Test	Capacity	=I\$20&"="&TEXT(L19,"0.E+0")&" to "&TEXT(M19,"0.E+0")					
21	689298.9	50594.49	1E-07						

<p>Resulting heading shows,</p>	
<p>Copy cell L20 to range M20:N20.</p>	
<p>Filter based on pumped volumes entered in cell L21 and is <code>=IF(AND(\$I21>=L\$19,\$I21<=M\$19),\$F21,\$J\$19)</code></p>	
<p>Locking of cell references is variable and significant. References to volume pumped for each aquifer test are \$I21 so column reference is fixed and row reference is relative.</p>	
<p>References to volume pumped for each category are L\$19 and M\$19 so row reference is fixed and column references are relative.</p>	

Copy equation in cell L21 to range L21:N291.

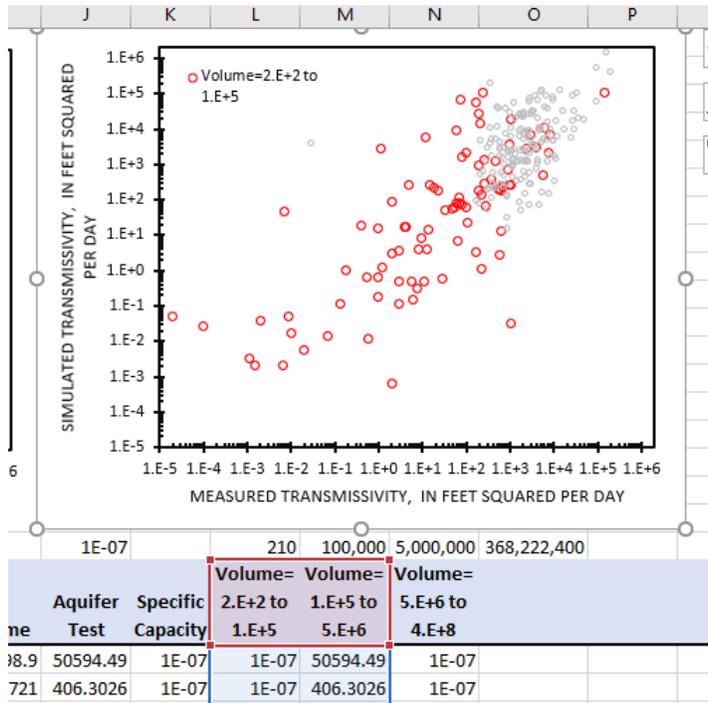
	L	M	N	
19	210	100,000	5,000,000	368,222,400
	Volume=	Volume=	Volume=	
	2.E+2 to	1.E+5 to	5.E+6 to	
20	1.E+5	5.E+6	4.E+8	
21	1E-07	50594.49	1E-07	
22	1E-07	406.3026	1E-07	
23	694.7257	1E-07	1E-07	
24	1E-07	18295.82	1E-07	

Copy the chart with Ctrl+Drag.

Let go of left-mouse button where you want copy.

Select Chart Area.

Drag references to first 2 volume categories in columns **L** and **M**.



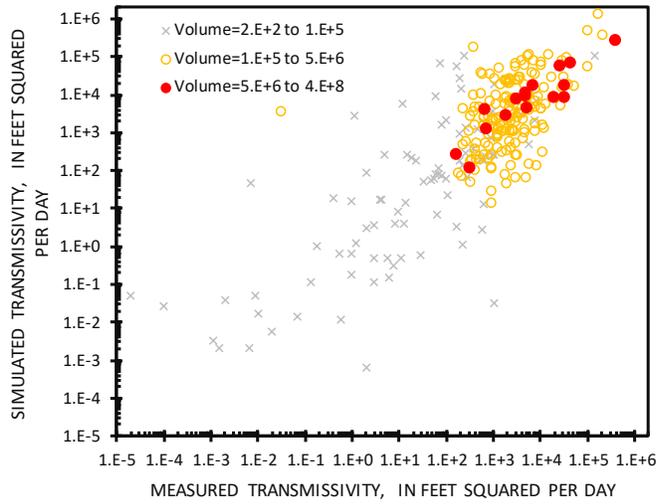
Grab upper, right corner of data range for plot.

	210	100,000	5,000,000	368,222,400
Volume=	Volume=	Volume=		
2.E+2 to	1.E+5 to	5.E+6 to		
1.E+5	5.E+6	4.E+8		
7	1E-07	50594.49	Plot Area	
7	1E-07	406.3026	1E-07	

Drag so that data range expands from 2 columns to 3 columns.

	210	100,000	5,000,000	368
	Volume=	Volume=	Volume=	
	2.E+2 to	1.E+5 to	5.E+6 to	
	1.E+5	5.E+6	4.E+8	
7	1E-07	50594.49	1E-07	
7	1E-07	406.3026	1E-07	

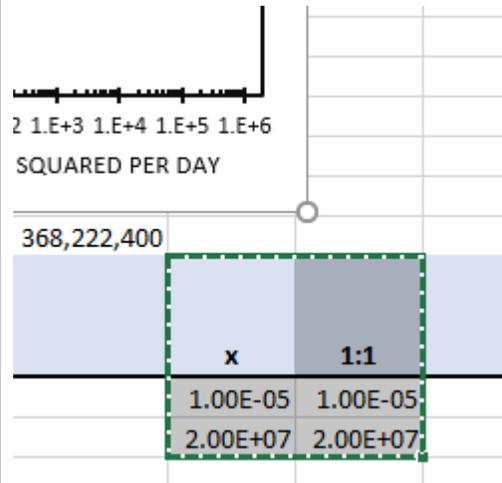
Format markers so that small volumes are obscure and large volumes are prominent.



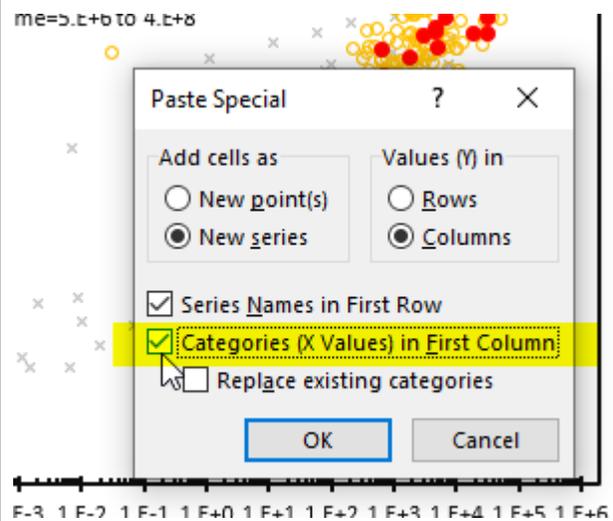
Create and add a 1:1 line.
Note preceding apostrophe (') in cell Q20 so that entry is interpreted as text and not converted to a time value of 1:01.

	P	Q	R	S
20	x	'1:1		
21	1.00E-05	1.00E-05		
22	2.00E+07	2.00E+07		

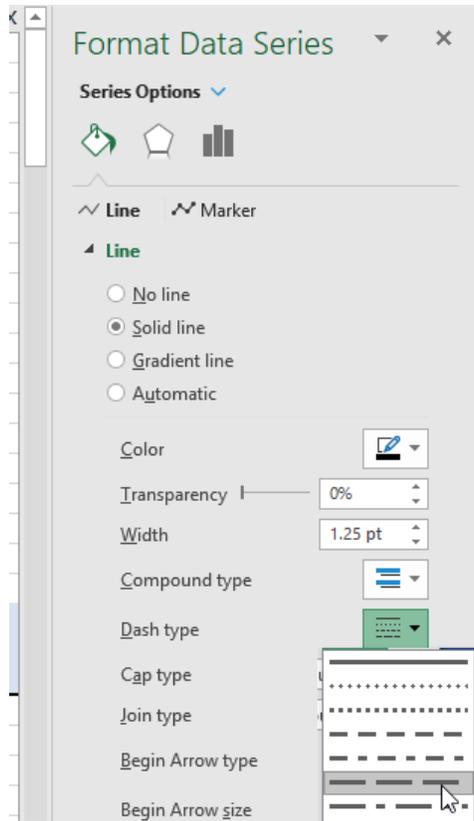
Copy range P20:Q22,
Select chart area, and
Paste special.



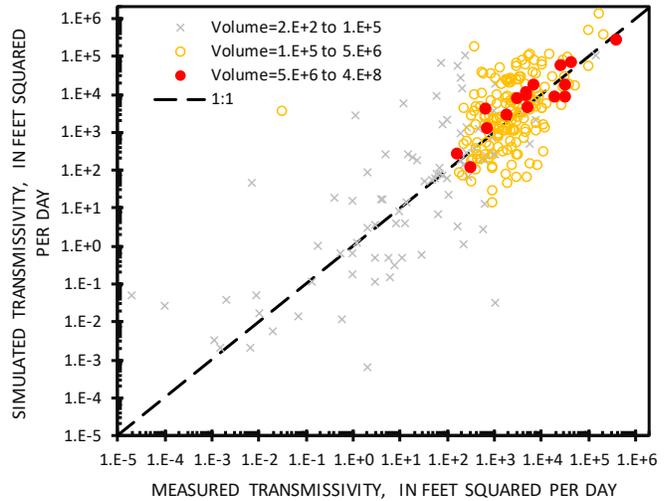
Check New series and
"Categories (X Values) in First Column."
Select OK.



Format 1:1 series with
No markers,
Solid, black line with long dashes.

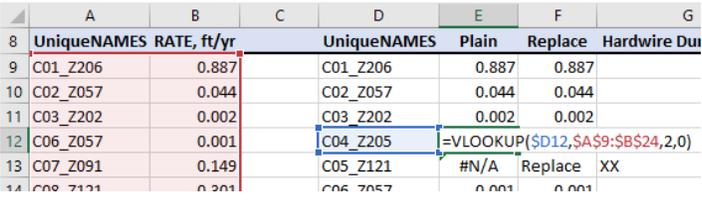
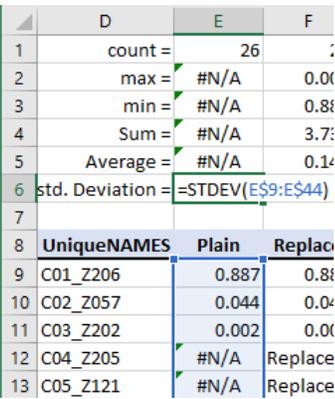
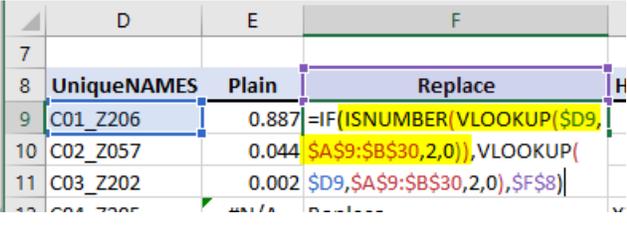


Final plot emphasizes larger pumped
volumes.



MAX, MIN, SUM, AVERAGE, STDEV and other numerical functions that calculate summary statistics from ranges of data return errors if an error exists in the target range. Identifying errors with an **IS...** function such as ISNUMBER and replacing error with a text string will keep statistical functions working correctly.

04_ErrorHandling.xlsx – Trap errors so statistical functions work

<p>VLOOKUP and MATCH functions return an error, #N/A, if an exact match is specified and the sought entry is missing from the lookup range.</p>	
<p>MAX, MIN, SUM, AVERAGE, STDEV functions that encounter a #N/A, #DIV/0!, #VALUE!, or any other error condition in a range echo the first error condition encountered in the target range.</p>	
<p>VLOOKUP in this example returns a number or #N/A. ISNUMBER says result is OK if true, so VLOOKUP occurs on TRUE side of IF. Text string in cell F8, Replace, is reported if ISNUMBER is FALSE.</p>	
<p>MAX, MIN, SUM, AVERAGE, STDEV functions work correctly if text string is encountered.</p>	