

**Detects Only Probability Plot Correlation Coefficient**  
**Chromium Concentrations Detected in Glen Rose Formation Limestone**  
**Camp Stanley Storage Activity, Texas**

Order(i)	Uniform Order Statistic Medians $m_i$	Normal Order Statistic Medians $M_i$	$M_i - M_{avg}$	$(M_i - M_{avg})^2$
1	0.08300	-1.38520	-1.38520	1.919
2	0.20114	-0.83757	-0.83757	0.702
3	0.32068	-0.46579	-0.46579	0.217
4	0.44023	-0.15039	-0.15039	0.023
5	0.55977	0.15039	0.15039	0.023
6	0.67932	0.46579	0.46579	0.217
7	0.79886	0.83757	0.83757	0.702
8	0.91700	1.38520	1.38520	1.919
			Total:	5.720
$M_{avg} =$		0.0000		

Normal			
Ordered Concentrations (mg/kg)	$X_i - X_{avg}$	$(X_i - X_{avg})^2$	$(X_i - X_{avg}) * (M_i - M_{avg})$
$x_{(0)}$			
±0			
±0			
2.0	-0.463	0.214	0.640654
2.0	-0.463	0.214	0.387377
2.2	-0.263	0.069	0.122271
2.2	-0.263	0.069	0.039478
2.4	-0.063	0.004	-0.009400
2.5	0.038	0.001	0.017467
2.7	0.238	0.056	0.198923
3.7	1.238	1.531	1.714181
Totals:		2.159	3.110952
$X_{avg} =$		2.4625	
$r =$		0.885326	

Lognormal			
Ln of Ordered Concentrations (mg/kg)	$X_i - X_{avg}$	$(X_i - X_{avg})^2$	$(X_i - X_{avg}) * (M_i - M_{avg})$
$\ln(x_{(0)})$			
0.00			
0.00			
0.69	-0.189	0.036	0.261694
0.69	-0.189	0.036	0.158236
0.79	-0.094	0.009	0.043604
0.79	-0.094	0.009	0.014079
0.88	-0.007	0.000	-0.000993
0.92	0.034	0.001	0.015940
0.99	0.111	0.012	0.093123
1.31	0.426	0.182	0.590459
Sum:		0.284	1.176142
$X_{avg} =$		0.8821	
$r =$		0.922507	

Nondetect  
Nondetect

**Probability Plot Correlation Coefficient<sup>a,b</sup>**

$$r = \frac{\sum_{i=1}^n (X_i - X_{avg}) * (M_i - M_{avg})}{\sqrt{\sum_{i=1}^n (X_i - X_{avg})^2 * \sum_{i=1}^n (M_i - M_{avg})^2}}$$

$M_i = \Phi^{-1}(m_i) =$  ith Normal order statistic median  
 where  $\Phi^{-1}$  = inverse of standard Normal cumulative distribution  
 $= f(z, 0, 1)^{-1} = \sqrt{2\pi} e^{z^2/2}$

$$m_i = \begin{cases} 1 - (.5)^{1/n} & \text{for } i = 1 \\ (i - .3175) / (n + .365) & \text{for } 1 < i < n \\ (.5)^{1/n} & \text{for } i = n \end{cases}$$

$M_{avg}$  = average of  $M_i$   
 $X_{avg}$  = average of  $X_i$

<sup>a</sup> The Probability Plot Correlation Coefficient Test for Normality, James J. Filliben, Technometrics, Vol. 17, No. 1, February 1975

<sup>b</sup> Statistical Training Course for Ground-Water Monitoring Data Analysis-Draft Addendum to Interim Final Guidance, EPA /530-R-93-003, 1992