



ALL-WEATHER ENVIRONMENTAL FIELD BOOK

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Rite in the Rain – A patented, environmentally responsible, all-weather writing paper that sheds water and enables you to write anywhere, in any weather. Using a pencil or all-weather pen, *Rite in the Rain* ensures that your notes survive the rigors of the field, regardless of the conditions.

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CONTENTS

| PAGE | REFERENCE | DATE |
|------|-----------|------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
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| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Reference Page Index

- 147 Error codes, Hazardous classifications, Container types
- 148 Sampling guidelines (Liquids)
- 149 Sampling guidelines (Solids)
- 150 Approximate Volume of Water in Casing or Hole, Ground Water Monitoring Well
- 151 PVC Pipe casing tables
- 152 Soil Classification
- 153 Soil Classification
- 154 Conversions (Length, Weight, Volume, Temp, etc...)
- 155 Conversions (Concentrations, Volume/Flow or Time, Velocity, Acceleration)
- 156 Maximum Concentration of Contaminants for the Toxicity Characteristic

Location _____ Date _____

Project / Client _____

ODD PAGES
3 - 145

4

Location _____ Date _____

Project / Client _____

**EVEN PAGES
4 - 146**

The manufacturers of *Rite in the Rain* all-weather writing products are grateful to the numerous environmental experts who have contributed to the development of this book. Should you have any additions, improvements or corrections for future publications of this field book or have suggestions for other environmental field book formats, we welcome your input.

Although much effort has been taken to ensure the accuracy of the following reference pages, the J. L. Darling Corp. cannot guarantee the accuracy of the data.

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Common Field Data Error Codes

Error codes are used to explain common mistakes and are written above or close to the mistake.

Commonly used error codes include:

- RE Recording Error
- CE Calculation Error
- TE Transcription Error
- SE Spelling Error
- CL Changed for Clarity
- DC Original Sample Description
Changed After Further Evaluation
- WO Write Over
- NI Not Initialed and Dated at Time of Entry
- OB Not Recorded at the Time of Initial Observation

Note: Error code should be circled, dated, and initialed when recorded.

Hazard Classifications

- Class 1 Explosives
- Class 2 Gas
- Class 3 Flammable Liquid
- Class 4 Flammable Solids (Potential spontaneous combustion, or emission of flammable gases when in contact with water)
- Class 5 Oxidizing Substances and Organic Peroxides
- Class 6 Toxic (poisonous) and infectious substances
- Class 7 Radioactive material
- Class 8 Corrosives
- Class 9 Miscellaneous dangerous goods

Container type abbreviations (for sampling guidelines)

- BR - Boston Round • ABR - Amber Boston Round • AJ - Amber Jug •
- AWM - Amber Wide Mouth • Poly - Polyethylene Bottles • BOD - Bottle •
- CWM - Clear Wide Mouth

Sample Collection & Analysis Guidelines for Surface Water, Effluent and Drinking Water

| <u>Parameters</u> | <u>Analysis Volume</u> | <u>EPA Method #</u> | <u>Con-tainer</u> | <u>Preservative</u> | <u>Holding Times</u> |
|-------------------------------|------------------------|---------------------|-------------------|--|----------------------|
| Acidity | 100 ml | 305 | Poly | Cool @ 4°C | 14 days |
| Alkalinity | 100 ml | 310 | Poly | Cool @ 4°C | 14 days |
| Ammonia | 400 ml | 350 | Poly | pH<2 H ₂ SO ₄ , 4°C | 28 days |
| Asbestos (Drinking Water) | 2 l | 600/4-83-043 | ABR | 4°C | 48 hours |
| Biochemical Oxygen Demand | 1l | 405.1 | Poly | Cool @ 4°C | 48 hours |
| Bromide | 100 ml | 320.1 | Poly | none required | 28 days |
| Chemical Oxygen Demand | 50 ml | 410 | Poly | pH<2 H ₂ SO ₄ , 4°C | 28 days |
| Chloride | 50 ml | 300.0, 325 | Poly | none required | 28 days |
| Chlorine total residual | 200 ml | 330 | Poly | none required | Analyze ASAP |
| Color | 50 ml | 110 | Poly | Cool @ 4°C | 48 hours |
| Cyanide total & amenable | 500 ml | 335.2, 335.1 | Poly | (2) pH>12 NaOH&.6 gm Asbc. Acid 4°C | 14 days |
| Fluoride | 300 ml | 300.0, 340 | Poly | none required | 28 days |
| Hardness | 100 ml | 130 | Poly | pH<2 HNO ₃ /Cool 4°C | 6 months |
| Hydrogen Ion (pH) | 25 ml | 150 | Poly | none required | Analyze ASAP |
| Kjeldahl & Organic Nitrogen | 500 ml | 351 | Poly | pH<2 H ₂ SO ₄ , 4°C | 28 days |
| Chromium VI | 200 ml | 218.4, 218.5 | Poly | Cool @ 4°C | 24 hours |
| Mercury | 100 ml | 245 | Poly | pH<2 HNO ₃ | 28 days |
| Metals (except Hg + Crui) | 200 ml | 200 series/200.7 | Poly | pH<2 HNO ₃ | 6 months |
| Nitrate | 100 ml | 300.0, 352.1 | Poly | Cool @ 4°C | 48 hours |
| Nitrate-Nitrite | 100 ml | 300.0, 353 | Poly | Cool @ 4°C | 28 days |
| Nitrite | 50 ml | 300.0, 354.1 | Poly | Cool @ 4°C | 48 hours |
| Oil & Grease | 1l | 413 | ABR | pH<2 H ₂ SO ₄ /HCl, 4°C | 28 days |
| Organic Carbon (TOC) | 25 ml | 415 | Poly | pH<2 HCl/H ₂ SO ₄ , 4°C Dark | 28 days |
| Oxygen, dissolved (probe) | 300 ml | 360.1 | BOD Btl. | none required | Analyze ASAP |
| Oxygen, dissolved (winkler) | 300 ml | 360.2 | BOD Btl. | (3) fix on site/dark | 8 hours |
| Petrol. Hydrocarbons (TRPH) | 1l | 418.1 | ABR | pH<2 HCl, 4°C | Analyze ASAP |
| Phenolics | 500 ml | 420 | ABR | pH<2 H ₂ SO ₄ , 4°C | 28 days |
| Phosphorus Hydrolyzable | 50 ml | 365 | Poly | pH<2 H ₂ SO ₄ , 4°C | 28 days |
| Phosphorus, Orthophosphate | 50 ml | 300.0, 365 | Poly | filter immed. 4°C | 48 hours |
| Phosphorus, total | 50 ml | 365 | Poly | pH<2 H ₂ SO ₄ , 4°C | 28 days |
| Phosphorus, total dissolved | 50 ml | 365 | Poly | Filter, pH<2 H ₂ SO ₄ , 4°C | 24 hours |
| Residue, total | 100 ml | 160.3 | Poly | Cool @ 4°C | 7 days |
| Residue, filterable (TDS) | 100 ml | 160.1 | Poly | Cool @ 4°C | 7 days |
| Residue, non-filterable (TSS) | 100 ml | 160.2 | Poly | Cool @ 4°C | 7 days |
| Residue, settleable | 1l | 160.5 | ABR | Cool @ 4°C | 48 hours |
| Residue, volatile | 100 ml | 160.4 | Poly | Cool @ 4°C | 7 days |
| Silica | 50 ml | 370.1, 200.7 | Poly | Cool @ 4°C | 28 days |
| Specific Conductance | 100 ml | 120.1 | Poly | Cool @ 4°C | 28 days |
| Sulfate | 100 ml | 300.0, 375 | Poly | Cool @ 4°C | 28 days |
| Sulfide | 500 ml | 376 | Poly | pH>9 NaOH, ZnOAc, 4°C | 7 days |
| Sulfite | 50 ml | 377.1 | Poly | none required | Analyze ASAP |
| Surfactants (MBAS) | 250 ml | 425.1 | Poly | Cool @ 4°C | 48 hours |
| Temperature | 1l | 170.1 | Poly | none required | Analyze ASAP |
| Turbidity | 100 ml | 180.1 | Poly | Cool @ 4°C | 48 hours |
| Purgeable Halocarbons | 5 ml | 601, 624 | GV | (1) .025% Na ₂ S ₂ O ₃ , 4°C | 14 days |
| Purgeable aromatic Hyd. carb. | 5 ml | 602, 604 | GV | (1) pH<2 HCl, .025% Na ₂ S ₂ O ₃ , 4°C | 14 days |
| Acrolein & Acrylonitrile | 5 ml | 603, 1624 | GV | (1) pH 4-5, .025% Na ₂ S ₂ O ₃ , 4°C | 14 days |
| Phenols | 1l | 604, 625 | ABR | (1) .008% Na ₂ S ₂ O ₃ , 4°C | 7 days |
| Benzidines | 1l | 605, 625 | ABR | (1) .008% Na ₂ S ₂ O ₃ , 4°C pH=4, Dark | 7 days |
| Phthalate Esters | 1l | 606, 625 | ABR | Cool @ 4°C | 7 days |
| Nitrosamines | 1l | 607, 625 | ABR | (1) .008% Na ₂ S ₂ O ₃ , 4°C Dark pH 7-10 | 7 days |
| PCB's | 1l | 608, 625 | ABR | .008% Na ₂ S ₂ O ₃ Cool 4°C | 7 days |
| Pesticides, Chlorinated | 1l | 608, 625 | ABR | (1) pH 5-9, Cool 4°C, Na ₂ S ₂ O ₃ | 7 days |
| Nitroaromatics & Isophorone | 1l | 609, 625 | ABR | Cool @ 4°C | 7 days |

| Parameters | Volume | EPA Method Water/ Wastewater | Con- tainer | Preservative | Holding Times |
|----------------------------------|---------------|---|------------------------|--|--------------------------|
| Polynuclear Aromatic Hydrocarbon | 1l | 610, 625 | ABR | (1) .008% Na ₂ S ₂ O ₃ 4°C Dark | 7 days |
| Haloethers | 1l | 611, 625 | ABR | (1) .008% Na ₂ S ₂ O ₃ 4°C | 7 days |
| Chlorinated Hydrocarbons | 1l | 612, 625 | ABR | .008% Na ₂ S ₂ O ₃ Cool 4°C | 7 days |
| Chlorinated Herbicides | 1l | 6640B(SM 19th Ed.) | ABR | (1) Cool 4°C, .008% Na ₂ S ₂ O ₃ | 7 days |
| Dioxins & Furans | 1l | 613, 1613 | ABR | (1) .008% Na ₂ S ₂ O ₃ 4°C | 7 days |
| Coliform, Fecal & Total | 100 ml | 9221, 9222-SM 19th | Poly | (1) .008% Na ₂ S ₂ O ₃ 4°C | 6 hours |
| Fecal Streptococci | 100 ml | 9230 (SM 19th Ed.) | Poly | (1) .008% Na ₂ S ₂ O ₃ 4°C | 6 hours |
| Volatile Organics | 5 ml | 624, 1624 | GV | 0.025% Na ₂ S ₂ O ₃ pH HCl Cool @ 4°C | 14 days |
| Semi-Volatile Organics | 1l | 625, 1625 | ABR | (1) Cool 4°C, .008% Na ₂ S ₂ O ₃ | 7 days |

Sampling Guidelines For Solids

| Parameters | Sample Weight | EPA Method # | Con- tainer | Holding Times |
|--|--------------------------|-------------------------|------------------------|--------------------------|
| Hydrogen Ion (pH) | 20 g | 9045 | CWM | Analyze ASAP |
| Chromium VI | 2 g | 7196, 7199 | CWM | 24 Hours |
| Mercury | 2 g | 7471 | CWM | 28 days |
| Metals (except Chromium VI&HG) | 2 g | 7000 Series, 6010, 6020 | CWM | 6 months |
| Nitrate | 70-1000 | 9210 | CWM | Analyze ASAP |
| Oil & Grease | 20 g | 9071 | CWM | Analyze ASAP |
| Organic Carbon (TOC) | 10 g | 9060 | CWM | Analyze ASAP |
| Sulfide | | 9030, 9031, 9034 | CWM | 7 days |
| Purgeable Halocarbons | 5 g | 8021, 8260 | CWM | 14 days |
| Purgeable Aromatic Hydrocarbons | 5 g | 8021, 8260 | CWM | 14 days |
| Acrolein & Acrylonitrile | 5 g | 8060 | CWM | 14 days |
| Phenols | 30 g | 8041, 8278 | CWM | 7 days(40 days AE) |
| Benzidines | 30 g | 8325 | CWM | 7 days(40 days AE) |
| Phthalate Esters | 30 g | 8061, 8270 | CWM | 7 days(40 days AE) |
| Nitrosamines | 30 g | 8070, 8270 | AWM | 7 days(40 days AE) |
| PCB's | 30 g | 8082, 8275 | CWM | 7 days(40 days AE) |
| Pesticides, Chlorinated | 30 g | 8081 | CWM | 7 days(40 days AE) |
| Nitroaromatics & Isophorone | 30 g | 8091, 8270 | AWM | 7 days(40 days AE) |
| Polynuclear Aromatic Hydrocarbon | 30 g | 8100, 8270, 8310, 8275 | AWM | 7 days(40 days AE) |
| Haloethers | 30 g | 8111, 8270 | CWM | 7 days(40 days AE) |
| Chlorinated Hydrocarbons | 30 g | 8121, 8270 | CWM | 7 days(40 days AE) |
| Chlorinated Herbicides | 50 g | 8151, 8321 | CWM | 7 days(40 days AE) |
| Dioxins & Furans | 10 g | 8280, 8290 | AWM | 7 days(40 days AE) |
| Pesticides, Organophosphorus | 50 g | 8141, 8321 | CWM | 7 days(40 days AE) |
| Nonhalogenated Hydrocarbons | 5 g | 8015, 8260 | CWM | 14 days |
| Volatile Organics | 5 g | 8260 | CWM | 14 days |
| Semi-Volatile Organics | 30 g | 8270, 8410 | CWM | 7 days(40 days AE) |
| TCLP Extraction (Hazardous Waste Tox.) | 300 g | 1311 | CWM | 14 days TCLP Ext. |
| Hazardous Waste Ignitability | varies | 1030 | CWM | Analyze ASAP |
| Hazardous Waste Reactivity-Cyn./Sulf. | 10 g | 7.3.3.2, 7.3.4.2 | AWM | Analyze ASAP |

Approximate Volume of Water in Casing or Hole

| Diameter of Casing or Hole (In.) | Gallons Per Foot of Depth | Cubic Feet Per Foot of Depth | Liters Per Meter of Depth | Cubic Meters Per Meter of Depth |
|----------------------------------|---------------------------|------------------------------|---------------------------|---------------------------------|
| 1 | 0.041 | 0.0055 | 0.509 | 0.509×10^{-3} |
| 1 ½ | 0.092 | 0.0123 | 1.142 | 1.142×10^{-3} |
| 2 | 0.163 | 0.0218 | 2.024 | 2.024×10^{-3} |
| 2 ½ | 0.255 | 0.0341 | 3.167 | 3.167×10^{-3} |
| 3 | 0.367 | 0.0491 | 4.558 | 4.558×10^{-3} |
| 3 ½ | 0.500 | 0.0668 | 6.209 | 6.209×10^{-3} |
| 4 | 0.653 | 0.0873 | 8.110 | 8.110×10^{-3} |
| 4 ½ | 0.826 | 0.1104 | 10.26 | 10.26×10^{-3} |
| 5 | 1.020 | 0.1364 | 12.67 | 12.67×10^{-3} |
| 5 ½ | 1.234 | 0.1650 | 15.33 | 15.33×10^{-3} |
| 6 | 1.469 | 0.1963 | 18.24 | 18.24×10^{-3} |
| 7 | 2.000 | 0.2673 | 24.84 | 24.84×10^{-3} |
| 8 | 2.611 | 0.3491 | 32.43 | 32.43×10^{-3} |
| 9 | 3.305 | 0.4418 | 41.04 | 41.04×10^{-3} |
| 10 | 4.080 | 0.5454 | 50.67 | 50.67×10^{-3} |
| 11 | 4.937 | 0.6600 | 61.31 | 61.31×10^{-3} |
| 12 | 5.875 | 0.7854 | 72.96 | 72.96×10^{-3} |
| 14 | 8.000 | 1.069 | 99.35 | 99.35×10^{-3} |
| 16 | 10.44 | 1.396 | 129.65 | 129.65×10^{-3} |
| 18 | 13.22 | 1.767 | 164.18 | 164.18×10^{-3} |
| 20 | 16.32 | 2.182 | 202.68 | 202.68×10^{-3} |
| 22 | 19.75 | 2.640 | 245.28 | 245.28×10^{-3} |
| 24 | 23.50 | 3.142 | 291.85 | 291.85×10^{-3} |
| 26 | 27.58 | 3.687 | 342.52 | 342.52×10^{-3} |
| 28 | 32.00 | 4.276 | 397.41 | 397.41×10^{-3} |
| 30 | 36.72 | 4.909 | 456.02 | 456.02×10^{-3} |
| 32 | 41.78 | 5.585 | 518.87 | 518.87×10^{-3} |
| 34 | 47.16 | 6.305 | 585.68 | 585.68×10^{-3} |
| 36 | 52.88 | 7.069 | 656.72 | 656.72×10^{-3} |

Permanent Monitoring Well

1 Gallon water weighs 8.33 lbs. = 3.785 Kg

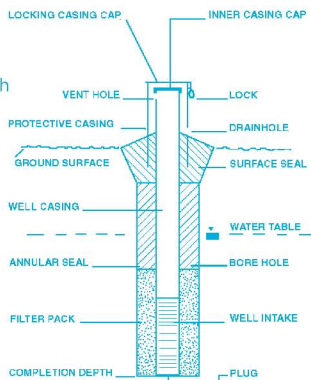
1 Liter water weighs 1 Kg = 2.205 lbs

1 Gallon per foot of depth = 12.419 liters per meter of depth

$$V = \pi r^2 h \text{ (Volume of a Cylinder)}$$

height of water column = (well depth) - (depth to water)

water column vol (Gal) = (height of water column)
x (volume/foot value of a well diameter)



Schedule 40 PVC Pipe

| Nominal size | Max PSI at 74° F | OD | ID | Nominal wall | Nominal Weight per 100 |
|--------------|------------------|---------|---------|--------------|------------------------|
| ½" | 600 | 0.840" | | 0.109" | 16.2 Lbs |
| ¾" | 480 | 1.050" | 0.824" | 0.113" | 21.5 Lbs |
| 1" | 450 | 1.315" | 1.049" | 0.133" | 32.0 Lbs |
| 1 ¼" | 370 | 1.660" | 1.380" | 0.140" | 43.4 Lbs |
| 1 ½" | 330 | 1.900" | 1.610" | 0.145" | 51.9 Lbs |
| 2" | 280 | 2.375" | 2.067" | 0.154" | 69.8 Lbs |
| 2 ½" | 300 | 2.875" | 2.469" | 0.203" | 111.0 Lbs |
| 3" | 260 | 3.500" | 3.068" | 0.216" | 145.0 Lbs |
| 4" | 220 | 4.500" | 4.026" | 0.237" | 206.0 Lbs |
| 5" | n/a | 5.563" | 5.047" | 0.258" | 277.0 Lbs |
| 6" | 180 | 6.625" | 6.065" | 0.280" | 363.0 Lbs |
| 8" | 160 | 8.625" | 7.961" | 0.332" | 563.0 Lbs |
| 10" | 140 | 10.750" | 10.020" | 0.365" | 775.0 Lbs |
| 12" | 130 | 12.750" | 11.938" | 0.406" | 1030.0 Lbs |

Schedule 80 PVC Pipe

| Nominal size | Max PSI at 74° F | OD | ID | Nominal wall | Nominal Weight per 100 |
|--------------|------------------|---------|---------|--------------|------------------------|
| ½" | 850 | 0.840" | 0.546" | 0.147" | 20.6 Lbs |
| ¾" | 690 | 1.050" | 0.742" | 0.154" | 28.0 Lbs |
| 1" | 630 | 1.315" | 0.957" | 0.179" | 41.3 Lbs |
| 1 ¼" | 520 | 1.660" | 1.278" | 0.191" | 57.1 Lbs |
| 1 ½" | 470 | 1.900" | 1.500" | 0.200" | 69.2 Lbs |
| 2" | 400 | 2.375" | 1.939" | 0.218" | 95.8 Lbs |
| 2 ½" | 420 | 2.875" | 2.323" | 0.276" | 146.0 Lbs |
| 3" | 370 | 3.500" | 2.900" | 0.300" | 196.0 Lbs |
| 4" | 320 | 4.500" | 3.826" | 0.337" | 286.0 Lbs |
| 5" | n/a | 5.563" | 4.768" | 0.375" | 392.0 Lbs |
| 6" | 280 | 6.625" | 5.761" | 0.432" | 546.0 Lbs |
| 8" | 245 | 8.625" | 7.625" | 0.500" | 830.0 Lbs |
| 10" | 230 | 10.750" | 9.564" | 0.593" | 1230.0 Lbs |
| 12" | 230 | 12.750" | 11.376" | 0.687" | 1690.0 Lbs |

Soil Classification

| | Millimeters | Inches | Sieve Sizes |
|-----------------------------|-------------|------------|------------------|
| Boulders | >300 | >11.8 | - |
| Cobbles | 75 - 300 | 2.9 - 11.8 | - |
| Coarse Gravel | 75 - 19 | 2.9 - .75 | - |
| Fine Gravel | 19 - 4.8 | .75 - .19 | 3/4" - No. 4 |
| Coarse Sand | 4.8 - 2.0 | .19 - .08 | No. 4 - No. 10 |
| Medium Sand | 2.0 - .43 | .08 - .02 | No. 10 - No. 40 |
| Fine Sand | .43 - .08 | .02 - .003 | No. 40 - No. 200 |
| Fine Silt & Clay | <.08 | <.003 | >No. 200 |

Clay

| Clay Consistency | Thumb Penetration | SPT, N Blows/Ft. | Undrained shear strength c (PSF) Torvane | Unconfined Compressive Strength q Pocket Penetrometer |
|------------------|--|------------------|--|---|
| Very Soft | Penetrated several inches by thumb. Escapes between thumb and fingers when squeezed in hand. | <2 | 250 | 500 |
| Soft | Penetrated one inch by thumb. Molded by light finger pressure. | 2 - 4 | 250 - 500 | 500 - 1000 |
| Medium Soft | Penetrated over 1/4" by thumb with moderate effort. Molded by strong finger pressure. | 4 - 8 | 500 - 1000 | 1000 - 2000 |
| Stiff | Indented 1/4" with thumb, but only penetrated with great effort. | 8 - 15 | 1000 - 2000 | 2000 - 4000 |
| Very Stiff | Readily indented by thumbnail. | 15 - 30 | 2000 - 4000 | 4000 - 8000 |
| Hard | Indented only with difficulty, by thumbnail. | >30 | >4000 | >8000 |

Sand

| Soil Type | SPT N Blows/Ft. | Relative Density% | Field Test |
|-----------------|-----------------|-------------------|--|
| Very Loose Sand | 4 | 0 - 15 | Easily Penetrated with 1/2" rod pushed by hand. |
| Loose Sand | 4 - 10 | 15 - 35 | Easily Penetrated with 1/2" rod pushed by hand. |
| Med. Dense Sand | 10 - 30 | 35 - 65 | Penetrated a foot with 1/2" rod driven with a 5 lb hammer. |
| Dense Sand | 30 - 50 | 65 - 85 | Penetrated a foot with 1/2" rod driven with a 5 lb hammer. |
| Very Dense Sand | 50 | 85 - 100 | Penetrated inches with 1/2" rod driven with a 5 lb hammer. |

Soil Classification

| | | | | |
|--|---|--|--|--|
| Coarse-grained Soils More than half of material is larger than No. 200 sieve | Gravel More than half of coarse fraction is larger than No. 4 sieve size | Clean gravels (Little or no fines) | GW | Well-graded gravels, gravel sand mixtures, little or no fines. |
| | | | GP | Poorly-graded gravels, gravel sand mixtures, little or no fines. |
| | | Gravels with fines (Appreciable amount of fines) | GM | Silty gravels, gravel-sand-silt mixtures. |
| | | | GC | Clayey gravels, gravel-sand-clay mixtures. |
| | Sands More than half of coarse fraction is smaller than No. 4 sieve size | Clean sands (Little or no fines) | SW | Well-graded sands, gravelly sands, little or no fines. |
| | | | SP | Poorly-graded sands, gravelly sands, little or no fines. |
| | | Sands with fines (Appreciable amount of fines) | SM | Silty sands, sand-silt mixtures. |
| | | | SC | Clayey sands, sand-clay mixtures. |
| Fine-grained Soils More than half of material is smaller than No. 200 sieve | Silts and Clays Liquid limit less than 50 | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity. | |
| | | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. | |
| | | OL | Organic silts and organic silty clays of low plasticity. | |
| | Silts and Clays Liquid limit greater than 50 | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. | |
| | | CH | Inorganic clays of high plasticity, fat clays. | |
| | | OH | Organic clays of medium to high plasticity, organic silts. | |
| | Highly Organic | Pt | Peat and other highly organic soils. | |

Additional Conversions**Concentrations**

mg/L = 1000.30 ppb

mg/L = 1.00030 ppm

ppb = 0.00100 mg/L

ppm = .99970 mg/L

mg/L = (0.00245 x cu.ft./sec.) tonnes/day

mg/L = (0.0000864 x L/sec.) tonnes/day

mg/L = (0.00270 x cu.ft./sec.) tons/day

tons/day = (370.79782 ÷ cu.ft./sec.) mg/L

tonnes/day = (408.73452 ÷ cu.ft./sec) mg/L

tonnes/day = (11574.07407 ÷ L/sec.) mg/L

Volume/ Flow or Time

Cubic ft./sec. = 1.98347 Acre ft./day

Cubic ft./sec. = 0.64632 Million gallons/day

Cubic ft./sec. = 448.83117 Gallons/min.

Cubic ft./sec. = 0.02832 Cubic meters/sec.

Cubic ft./sec. = 28.31685 Liters/sec.

Cubic ft./sec. = 373.73 Imperial gallons/min.

Gallons/min. = 0.00223 Cubic ft./sec.

Gallons/min. = 6.309×10^{-5} Cubic meters/sec.

Gallons/min. = 0.06309 Liters/sec.

Cubic meters/sec. = 1000.00012 Liters/sec.

Cubic meters/sec. = 35.31467 Cubic ft./sec.

Liters/sec. = 0.001 Cubic meters/sec.

Liters/sec. = 0.03531 Cubic ft./sec.

Liters/sec. = 15.85032 Gallons/min.

Million gallons/day = 1.54723 Cubic ft./sec.

Million gallons/day = 3.06888 Acre ft./day

Acre ft./day = 0.504167 Cubic ft./sec.

Acre ft./day = 0.325851 Million gallons/day

Velocity

ft./sec. = 0.304800 m/s

ft./sec. = 0.681818 mph

km/hr. = 0.277778 m/s

km/hr. = 0.621371 mph

Acceleration

ft./s/s = 0.304600 m/s/s

m/s/s = 3.280640 ft./s/s

**Maximum Concentration of Contaminants
for the Toxicity Characteristic**

| EPA HW NUMBER* | | REGULATORY LEVEL (mg/L) | ANALYTE CATEGORY |
|----------------|---------------------------------|-------------------------|------------------|
| D004 | Arsenic | 5.0 | Metal |
| D005 | Barium | 100.0 | Metal |
| D018 | Benzene | 0.5 | Volatile |
| D006 | Cadmium | 1.0 | Metal |
| D019 | Carbon tetrachloride | 0.5 | Volatile |
| D020 | Chlordane | 0.03 | Pesticide |
| D021 | Chlorobenzene | 100.0 | Volatile |
| D022 | Chloroform | 6.0 | Volatile |
| D007 | Chromium | 5.0 | Metal |
| D023 | o-Cresol | 200.0 | Acid Extractable |
| D024 | m-Cresol | 200.0 | Acid Extractable |
| D025 | p-Cresol | 200.0 | Acid Extractable |
| D026 | Cresol | 200.0 | Acid Extractable |
| D016 | 2,4-D | 10.0 | Herbicide |
| D027 | 1,4-Dichlorobenzene | 7.5 | Base Neutral |
| D028 | 1,2-Dichloroethane | 0.5 | Volatile |
| D029 | 1,1-Dichloroethylene | 0.7 | Volatile |
| D030 | 2,4-Dinitrotoluene | 0.13 | Base Neutral |
| D012 | Endrin | 0.02 | Pesticide |
| D031 | Heptachlor (and its epoxide) | 0.008 | Pesticide |
| D032 | Hexachlorobenzene | 0.13 | Base Neutral |
| D033 | Hexachlorobutadiene | 0.5 | Base Neutral |
| D034 | Hexachloroethane | 3.0 | Base Neutral |
| D008 | Lead | 5.0 | Metal |
| D013 | Lidane | 0.4 | Pesticide |
| D009 | Mercury | 0.2 | Metal |
| D014 | Methoxychlor | 10.0 | Pesticide |
| D035 | Methyl ethyl ketone | 200.0 | Volatile |
| D036 | Nitrobenzene | 2.0 | Base Neutral |
| D037 | Pentachlorophenol | 100.0 | Acid Extractable |
| D038 | Pyridine | 5.0 | Base Neutral |
| D010 | Selenium | 1.0 | Metal |
| D011 | Silver | 5.0 | Metal |
| D039 | Tetrachloroethylene | 0.7 | Volatile |
| D015 | Toxaphene | 0.5 | Pesticide |
| D040 | Trichloroethylene | 0.5 | Volatile |
| D041 | 2,4,5-Trichlorophenol | 400.0 | Acid Extractable |
| D042 | 2,4,6-Trichlorophenol | 2.0 | Acid Extractable |
| D017 | 2,4,5-TP (Silvex) | 1.0 | Herbicide |
| D043 | Vinyl chloride | 0.2 | Volatile |

MEASUREMENT CONVERSIONS**U.S. to METRIC**

inch x 2.54 = centimeter

foot x 0.3048 = meter

yards x 0.914 = meter

mile x 1.609 = kilometer

quart x 0.946 = liter

gallon x 3.785 = liter

ounce x 28.349 = grams

lbs x 0.454 = kg

mpg x 0.245 = km/ltr

mph x 1.609 = km/hr

°F to °C (F - 32) x .555

METRIC to U.S.

centimeter x 0.394 = inch

meter x 3.28 = foot

meter x 1.094 = yards

kilometer x 0.621 = mile

liter x 1.057 = quarts

liter x 0.264 = gallon

grams x 0.035 = ounce

kg x 2.205 = lbs

km/ltr x 2.354 = mpg

km/hr x 0.621 = mph

°C to °F (C x 1.8) + 32

ENGLISH LINEAR MEASUREMENTS

12 inches = 1 foot

36 inches = 1 yard

3 feet = 1 yard

1,760 yards = 1 mile statute

2,026.8 yards = 1 mile nautical

5,280 feet = 1 mile statute

6,060.4 feet = 1 mile nautical

63,360 inches = 1 mile statute

72,963 inches = 1 mile nautical

MAP SCALES—ENGLISH & METRIC

| SCALE | 1 INCH = | 1 CENTIMETER = |
|-----------|------------------------------|------------------------------|
| 1:10,000 | 833.33 feet 254 meters | 328.1 feet 100 meters |
| 1:25,000 | 2,083.3 feet 635 meters | 820.2 feet 250 meters |
| 1:50,000 | 4,166.7 feet 1,270 meters | 1,640.4 feet 500 meters |
| 1:63,360 | 5,280 feet 1,609.3 meters | 2,078 feet 633.6 meters |
| 1:100,000 | 8,333.3 feet 2,540 meters | 3,280.8 feet 1,000 meters |
| 1:250,000 | 20,833 feet 6,350 meters | 8,202 feet 2,500 meters |
| 1:500,000 | 41,667 feet 12,700 meters | 16.404 feet 5,000 meters |



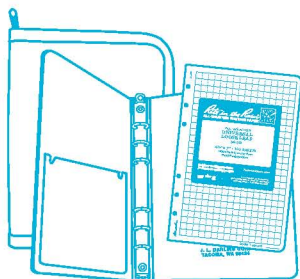
**Outdoor writing products
for Outdoor writing people**



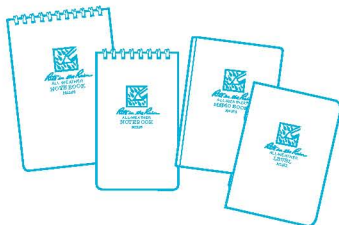
Copier & Ink-Jet Paper



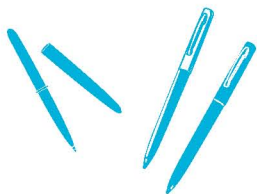
Bound Books



**Loose Leaf
with Ring Binder**



Memo Books



All-Weather Pens



Notebooks