Supplementary Table 1. Coordinates of the groundwater boreholes (samples), hydrogeochemical parameters, major anions, major cations, and HMs.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S.N** | **Latitudes** | **Longitudes** | **EC** | **pH** | **TDS** | **TH**  | **Ca** | **Mg** | **Na** | **K** | **Cl** | **HCO3** | **NO3** | **SO4** | **F** | **B** | **AL** | **Cr** | **Mn** | **Ni** | **Cu** | **Zn** | **As** | **Se** | **Cd** | **Sb** | **Ba** | **Pb** | **U** |
| **1** | **25** | **9** | **49** | **39** | **16** | **3** | **1058** | **7.55** | **687** | **484** | **86.90** | **26.80** | **133.60** | **4.50** | **93** | **356** | **29.00** | **111** | **1.63** | **431.54** | **2.13** | **0.13** | **0.16** | **1.11** | **1.58** | **2.56** | **1.74** | **1.13** | **0.10** | **0.10** | **26.34** | **0.10** | **9.78** |
| **2** | **25** | **1** | **46** | **39** | **17** | **25** | **821** | **7.66** | **533** | **1697** | **83.50** | **19.80** | **58.00** | **9.80** | **48** | **334** | **33.40** | **69** | **0.39** | **247.49** | **1.88** | **0.10** | **0.46** | **0.50** | **0.31** | **22.56** | **0.25** | **0.53** | **0.10** | **0.10** | **3.95** | **0.16** | **1.74** |
| **3** | **25** | **15** | **24** | **38** | **52** | **37** | **10360** | **7.45** | **6760** | **219** | **314.40** | **158.60** | **1816.00** | **28.80** | **2728** | **234** | **49.60** | **1400** | **0.81** | **1228.55** | **0.51** | **4.25** | **0.35** | **6.73** | **6.52** | **8.46** | **5.58** | **23.64** | **0.10** | **0.10** | **62.33** | **0.47** | **3.20** |
| **4** | **25** | **4** | **54** | **39** | **0** | **20** | **12090** | **7.13** | **7860** | **1438** | **429.20** | **304.00** | **1718.00** | **16.00** | **2920** | **261** | **86.30** | **2200** | **1.41** | **1888.38** | **0.75** | **1.87** | **0.48** | **12.96** | **6.22** | **3.80** | **7.34** | **23.62** | **0.10** | **0.10** | **23.55** | **0.10** | **11.40** |
| **5** | **25** | **6** | **43** | **39** | **6** | **13** | **715** | **7.41** | **464** | **3033** | **96.00** | **16.60** | **60.10** | **2.10** | **26** | **342** | **46.00** | **45** | **0.20** | **286.09** | **0.85** | **0.69** | **0.10** | **2.09** | **0.95** | **2.40** | **1.42** | **2.47** | **0.10** | **0.10** | **21.52** | **0.10** | **1.61** |
| **6** | **25** | **2** | **15.9** | **39** | **10** | **26.3** | **2360** | **7.64** | **1530** | **126** | **137.90** | **75.60** | **266.50** | **12.70** | **430** | **636** | **18.00** | **66** | **0.01** | **531.41** | **1.40** | **0.94** | **735.85** | **2.48** | **1.11** | **2.17** | **1.90** | **0.31** | **0.10** | **0.10** | **131.16** | **0.10** | **0.68** |
| **7** | **24** | **41** | **46.2** | **39** | **51** | **46.2** | **1213** | **7.28** | **885** | **655** | **70.50** | **42.80** | **201.90** | **9.90** | **65** | **751** | **13.40** | **51** | **0.85** | **567.02** | **0.50** | **2.31** | **2.23** | **4.58** | **0.23** | **0.51** | **2.01** | **3.47** | **0.10** | **0.10** | **8.00** | **0.10** | **0.66** |
| **8** | **24** | **43** | **53.6** | **39** | **50** | **41.3** | **2340** | **7.11** | **1510** | **1227** | **87.30** | **26.80** | **340.50** | **1.80** | **328** | **482** | **57.50** | **250** | **0.95** | **767.86** | **0.50** | **1.01** | **0.69** | **2.41** | **3.69** | **25.21** | **1.39** | **12.97** | **0.10** | **0.10** | **14.11** | **0.10** | **4.63** |
| **9** | **24** | **42** | **40.8** | **39** | **49** | **5.3** | **2830** | **7.16** | **1830** | **328** | **197.40** | **64.70** | **316.30** | **3.60** | **465** | **327** | **113.00** | **550** | **0.58** | **526.94** | **1.76** | **0.81** | **0.10** | **5.40** | **1.01** | **0.82** | **1.15** | **22.46** | **0.10** | **0.10** | **16.28** | **0.10** | **2.01** |
| **10** | **24** | **40** | **38.3** | **39** | **48** | **5.8** | **1756** | **7.20** | **1141** | **759** | **114.20** | **34.90** | **259.30** | **2.80** | **239** | **303** | **11.00** | **395** | **0.55** | **391.76** | **0.50** | **0.61** | **2.53** | **3.10** | **0.35** | **0.76** | **25.39** | **0.71** | **0.42** | **0.41** | **15.47** | **0.10** | **0.23** |
| **11** | **24** | **52** | **55.4** | **39** | **42** | **8** | **1466** | **8.07** | **954** | **429** | **64.30** | **36.20** | **256.80** | **18.80** | **94** | **854** | **15.00** | **22** | **1.30** | **294.23** | **0.50** | **0.59** | **7.37** | **3.00** | **0.13** | **2.16** | **2.95** | **1.94** | **0.10** | **0.10** | **10.61** | **0.10** | **0.23** |
| **12** | **24** | **42** | **2.6** | **39** | **38** | **36.1** | **4500** | **7.59** | **2920** | **310** | **84.40** | **71.60** | **791.60** | **9.70** | **864** | **767** | **40.00** | **505** | **1.28** | **233.40** | **0.50** | **1.21** | **0.41** | **3.79** | **0.27** | **4.00** | **6.45** | **1.75** | **0.11** | **0.10** | **20.13** | **0.10** | **2.77** |
| **13** | **25** | **0** | **58** | **39** | **26** | **24.5** | **3550** | **7.32** | **2300** | **505** | **338.50** | **50.30** | **389.00** | **6.60** | **712** | **186** | **39.00** | **800** | **1.71** | **721.27** | **2.22** | **0.55** | **0.11** | **6.44** | **2.18** | **8.68** | **1.65** | **2.21** | **0.18** | **0.10** | **20.95** | **0.13** | **5.46** |
| **14** | **26** | **11** | **20.9** | **39** | **35** | **47.5** | **382** | **7.68** | **247** | **1052** | **47.30** | **10.70** | **24.20** | **0.20** | **6** | **204** | **15.00** | **8** | **0.26** | **85.39** | **0.67** | **0.57** | **0.10** | **0.12** | **0.17** | **0.11** | **0.71** | **0.49** | **0.10** | **0.10** | **34.10** | **0.10** | **1.06** |
| **15** | **26** | **10** | **28.5** | **39** | **31** | **17.6** | **347** | **7.36** | **225** | **162** | **59.80** | **9.60** | **9.60** | **1.70** | **6** | **210** | **14.10** | **9** | **0.13** | **43.76** | **0.50** | **0.41** | **0.10** | **0.83** | **0.35** | **0.25** | **0.61** | **0.39** | **0.10** | **0.10** | **34.09** | **0.10** | **0.92** |
| **16** | **26** | **6** | **16.9** | **39** | **24** | **35.4** | **776** | **7.21** | **505** | **613** | **101.90** | **20.60** | **50.80** | **2.00** | **64** | **280** | **25.00** | **77** | **0.23** | **95.82** | **1.03** | **0.36** | **0.10** | **2.06** | **0.43** | **1.17** | **2.26** | **2.14** | **0.10** | **0.10** | **49.95** | **0.10** | **3.72** |
| **17** | **26** | **4** | **11.4** | **39** | **22** | **32.8** | **820** | **7.41** | **533** | **194** | **89.80** | **11.60** | **72.70** | **0.90** | **45** | **250** | **43.00** | **107** | **0.19** | **204.34** | **0.66** | **0.34** | **0.15** | **0.45** | **0.78** | **1.96** | **4.55** | **3.50** | **0.10** | **0.10** | **35.59** | **0.11** | **6.46** |
| **18** | **25** | **59** | **30.1** | **39** | **21** | **50.4** | **2710** | **7.58** | **1750** | **151** | **212.20** | **32.40** | **353.40** | **1.70** | **304** | **335** | **33.50** | **810** | **0.96** | **457.54** | **2.37** | **0.48** | **0.18** | **8.90** | **2.00** | **2.25** | **8.25** | **5.48** | **0.10** | **0.10** | **25.70** | **0.11** | **16.92** |
| **19** | **25** | **58** | **49.2** | **39** | **22** | **34.7** | **8490** | **7.63** | **5490** | **735** | **688.50** | **158.60** | **1087.50** | **2.80** | **1751** | **210** | **100.00** | **2140** | **0.89** | **1351.71** | **0.50** | **3.10** | **0.13** | **5.67** | **2.99** | **46.40** | **5.10** | **29.61** | **0.10** | **0.10** | **19.75** | **0.10** | **21.20** |
| **20** | **25** | **54** | **15.1** | **39** | **23** | **58** | **887** | **7.75** | **575** | **1574** | **34.10** | **30.50** | **93.00** | **1.60** | **59** | **368** | **35.00** | **46** | **0.25** | **138.86** | **1.83** | **2.91** | **0.10** | **0.11** | **0.24** | **0.77** | **0.86** | **2.89** | **0.10** | **0.10** | **14.13** | **0.10** | **2.83** |
| **21** | **25** | **55** | **15.2** | **39** | **22** | **58.4** | **1279** | **7.81** | **830** | **211** | **34.80** | **34.90** | **167.70** | **2.20** | **86** | **470** | **38.00** | **115** | **0.37** | **260.82** | **0.50** | **2.66** | **0.10** | **0.10** | **0.34** | **0.67** | **2.10** | **3.93** | **0.10** | **0.10** | **14.69** | **0.10** | **5.51** |
| **22** | **25** | **54** | **33.9** | **39** | **23** | **5.4** | **1456** | **7.97** | **947** | **231** | **48.60** | **66.40** | **139.20** | **3.20** | **150** | **407** | **82.00** | **154** | **0.81** | **195.67** | **0.50** | **5.66** | **0.10** | **0.34** | **0.16** | **0.86** | **0.64** | **4.19** | **0.10** | **0.10** | **20.41** | **0.10** | **2.68** |
| **23** | **25** | **53** | **14.7** | **39** | **24** | **47** | **1348** | **8.03** | **875** | **610** | **40.30** | **46.10** | **157.50** | **3.50** | **151** | **283** | **76.00** | **183** | **0.21** | **171.06** | **1.64** | **42.94** | **0.10** | **0.28** | **0.29** | **0.81** | **0.40** | **110.72** | **0.10** | **0.10** | **0.29** | **0.10** | **5.27** |
| **24** | **25** | **52** | **42.2** | **39** | **19** | **7.9** | **2370** | **8.02** | **1540** | **290** | **50.40** | **84.30** | **280.10** | **5.30** | **325** | **402** | **100.00** | **310** | **0.62** | **239.68** | **0.50** | **8.69** | **0.10** | **0.53** | **0.51** | **3.34** | **2.47** | **7.72** | **0.10** | **0.10** | **37.31** | **0.10** | **4.57** |
| **25** | **25** | **52** | **10.7** | **39** | **18** | **2.4** | **3520** | **7.85** | **2290** | **473** | **74.80** | **162.60** | **414.20** | **5.90** | **542** | **602** | **113.00** | **560** | **0.47** | **400.31** | **0.50** | **5.54** | **0.10** | **0.55** | **0.78** | **0.71** | **1.52** | **48.68** | **0.10** | **0.10** | **7.44** | **0.10** | **6.71** |
| **26** | **25** | **46** | **15.8** | **39** | **17** | **5.9** | **5320** | **7.90** | **3450** | **511** | **88.80** | **291.20** | **656.50** | **12.20** | **911** | **522** | **177.00** | **1020** | **0.46** | **423.19** | **1.34** | **13.96** | **0.32** | **1.09** | **2.01** | **1.35** | **0.76** | **44.69** | **0.10** | **0.10** | **0.39** | **0.10** | **1.37** |
| **27** | **25** | **45** | **50** | **39** | **16** | **52.8** | **5310** | **7.91** | **3440** | **1420** | **65.70** | **173.30** | **916.50** | **14.80** | **685** | **876** | **80.00** | **1125** | **0.66** | **925.08** | **0.87** | **22.11** | **0.10** | **0.87** | **2.49** | **1.03** | **0.68** | **41.11** | **0.11** | **0.10** | **0.18** | **0.10** | **6.27** |
| **28** | **25** | **45** | **28.6** | **39** | **17** | **9.9** | **2300** | **7.78** | **1490** | **877** | **67.50** | **64.10** | **355.80** | **6.00** | **228** | **399** | **94.00** | **530** | **0.52** | **410.21** | **3.86** | **45.85** | **0.18** | **0.98** | **1.12** | **1.18** | **1.09** | **19.12** | **0.10** | **0.10** | **0.27** | **0.10** | **3.35** |
| **29** | **25** | **37** | **52.4** | **39** | **42** | **42.7** | **1595** | **7.22** | **1035** | **174** | **11.00** | **16.70** | **287.30** | **6.60** | **169** | **364** | **18.50** | **231** | **0.22** | **631.67** | **0.19** | **33.14** | **0.12** | **0.69** | **0.31** | **123.31** | **1.23** | **12.89** | **0.10** | **0.10** | **0.41** | **0.44** | **2.20** |
| **30** | **25** | **45** | **37.9** | **39** | **17** | **10.6** | **3290** | **6.82** | **2160** | **96** | **36.80** | **122.80** | **507.00** | **10.50** | **343** | **712** | **23.00** | **680** | **0.68** | **423.71** | **0.18** | **42.39** | **0.10** | **3.54** | **2.53** | **17.22** | **1.40** | **34.61** | **0.12** | **0.10** | **0.35** | **0.10** | **6.16** |
| **31** | **25** | **44** | **4.5** | **39** | **16** | **34.2** | **3890** | **6.90** | **2510** | **597** | **22.40** | **49.80** | **700.20** | **18.00** | **444** | **800** | **1.00** | **672** | **0.13** | **1669.82** | **0.20** | **53.79** | **0.10** | **1.73** | **1.55** | **1.33** | **2.39** | **28.39** | **0.24** | **0.10** | **1.00** | **0.10** | **7.52** |
| **32** | **25** | **42** | **55.9** | **39** | **16** | **7.5** | **2630** | **6.84** | **1700** | **261** | **30.60** | **69.20** | **396.00** | **7.00** | **364** | **395** | **81.20** | **421** | **0.55** | **609.96** | **0.19** | **56.39** | **0.10** | **2.84** | **1.00** | **2.20** | **1.07** | **18.41** | **0.10** | **0.10** | **0.63** | **0.10** | **4.99** |
| **33** | **25** | **43** | **7.5** | **39** | **15** | **17.7** | **4220** | **6.89** | **2730** | **361** | **42.20** | **64.30** | **730.50** | **6.90** | **554** | **645** | **78.50** | **642** | **0.61** | **1051.24** | **0.21** | **32.43** | **0.10** | **3.45** | **1.49** | **2.49** | **1.34** | **28.88** | **0.10** | **0.10** | **4.81** | **0.10** | **8.24** |
| **34** | **25** | **35** | **52.4** | **39** | **13** | **22.2** | **11500** | **6.72** | **7490** | **490** | **598.00** | **711.60** | **1010.80** | **19.30** | **2900** | **320** | **177.80** | **1597** | **0.39** | **679.11** | **0.35** | **11.01** | **0.91** | **31.15** | **4.93** | **8.12** | **9.45** | **29.31** | **0.10** | **0.49** | **311.13** | **0.10** | **3.74** |
| **35** | **25** | **36** | **21.9** | **39** | **14** | **18.2** | **6790** | **6.75** | **4390** | **925** | **388.50** | **246.00** | **571.80** | **19.20** | **1630** | **246** | **103.30** | **960** | **0.61** | **265.94** | **0.52** | **13.86** | **0.25** | **19.26** | **2.59** | **4.02** | **5.95** | **20.15** | **0.10** | **0.10** | **2.36** | **0.10** | **2.08** |
| **36** | **25** | **42** | **59.3** | **39** | **15** | **44** | **2820** | **7.46** | **1830** | **799** | **185.30** | **87.80** | **235.10** | **46.36** | **370** | **413** | **75.60** | **431** | **0.68** | **718.83** | **54.22** | **50.91** | **6.66** | **3.80** | **1.03** | **2.76** | **1.86** | **15.64** | **0.39** | **0.10** | **0.66** | **18.97** | **4.30** |
| **37** | **25** | **45** | **13.7** | **39** | **16** | **32.6** | **1860** | **7.30** | **1223** | **824** | **159.30** | **73.30** | **111.30** | **14.29** | **176** | **376** | **23.30** | **350** | **0.75** | **247.93** | **2.99** | **57.28** | **1.57** | **1.69** | **1.97** | **2.59** | **1.24** | **17.96** | **0.13** | **0.10** | **0.28** | **0.13** | **1.93** |
| **38** | **25** | **39** | **3.9** | **39** | **14** | **29.8** | **3600** | **7.27** | **2340** | **850** | **189.50** | **104.50** | **414.50** | **13.19** | **660** | **380** | **21.50** | **482** | **0.27** | **369.43** | **3.48** | **21.46** | **0.81** | **4.28** | **1.42** | **3.12** | **2.99** | **10.92** | **0.10** | **0.10** | **16.24** | **0.10** | **11.30** |
| **39** | **25** | **34** | **55.4** | **39** | **14** | **32.9** | **7000** | **7.65** | **4550** | **1447** | **259.00** | **102.40** | **1073.73** | **130.57** | **1770** | **225** | **212.90** | **694** | **0.53** | **583.25** | **2.19** | **7.23** | **1.30** | **16.02** | **2.67** | **2.67** | **7.83** | **17.77** | **0.10** | **0.10** | **4.89** | **0.10** | **3.10** |
| **40** | **25** | **31** | **39.8** | **39** | **19** | **11** | **12870** | **7.21** | **8340** | **1068** | **382.00** | **350.20** | **2244.52** | **107.63** | **3700** | **278** | **175.50** | **1921** | **0.75** | **778.24** | **0.10** | **6.57** | **1.81** | **34.77** | **3.92** | **7.00** | **13.89** | **40.21** | **0.10** | **0.10** | **45.62** | **0.10** | **9.95** |
| **41** | **25** | **32** | **38.1** | **39** | **19** | **33.5** | **9550** | **7.05** | **6200** | **2395** | **311.70** | **343.87** | **1253.29** | **32.14** | **2066** | **283** | **52.40** | **1703** | **0.02** | **675.17** | **0.10** | **4.92** | **1.18** | **24.88** | **2.76** | **3.62** | **10.21** | **34.33** | **0.10** | **0.10** | **38.21** | **0.10** | **13.36** |
| **42** | **25** | **34** | **4.5** | **39** | **19** | **25.6** | **6260** | **7.03** | **4070** | **2193** | **282.00** | **301.87** | **680.00** | **13.80** | **1114** | **353** | **22.50** | **1495** | **0.33** | **648.46** | **0.10** | **21.21** | **0.54** | **11.80** | **1.82** | **2.41** | **5.60** | **24.85** | **0.10** | **0.10** | **18.12** | **0.10** | **12.58** |
| **43** | **25** | **33** | **10.5** | **39** | **21** | **21.3** | **2390** | **7.15** | **1560** | **407** | **135.00** | **95.30** | **305.20** | **7.00** | **372** | **238** | **102.00** | **455** | **0.41** | **192.53** | **0.50** | **61.69** | **0.09** | **2.51** | **2.33** | **1.62** | **1.00** | **14.43** | **0.10** | **0.10** | **12.86** | **0.10** | **6.58** |
| **44** | **25** | **43** | **21.5** | **39** | **25** | **21.2** | **1827** | **7.44** | **1170** | **1807** | **34.70** | **73.10** | **237.40** | **4.10** | **183** | **279** | **132.00** | **340** | **0.47** | **207.86** | **0.58** | **78.93** | **0.10** | **0.10** | **1.11** | **1.96** | **0.56** | **15.27** | **0.10** | **0.10** | **0.10** | **0.10** | **2.19** |
| **45** | **25** | **34** | **29.2** | **39** | **20** | **43.3** | **1865** | **7.45** | **1205** | **162** | **112.80** | **59.90** | **201.30** | **4.30** | **242** | **213** | **47.00** | **490** | **0.43** | **156.66** | **1.21** | **69.13** | **0.10** | **2.25** | **1.38** | **1.57** | **0.87** | **8.54** | **0.10** | **0.10** | **6.29** | **0.10** | **1.89** |
| **46** | **25** | **24** | **6.9** | **39** | **30** | **8.1** | **444** | **7.37** | **288** | **528** | **70.20** | **14.20** | **11.50** | **3.20** | **8** | **231** | **20.00** | **20** | **0.20** | **35.87** | **1.32** | **0.71** | **0.10** | **1.29** | **0.23** | **0.21** | **0.28** | **1.02** | **0.10** | **0.10** | **2.14** | **0.10** | **0.35** |
| **47** | **25** | **23** | **18.4** | **39** | **24** | **8.4** | **1745** | **7.76** | **1134** | **234** | **70.30** | **46.20** | **221.30** | **2.40** | **274** | **280** | **49.00** | **218** | **0.19** | **221.23** | **1.51** | **7.82** | **0.12** | **1.37** | **0.63** | **1.14** | **0.86** | **9.92** | **0.10** | **0.10** | **3.79** | **0.10** | **2.14** |
| **48** | **25** | **19** | **16.9** | **39** | **22** | **51.2** | **2250** | **7.68** | **1460** | **366** | **82.90** | **63.30** | **286.20** | **2.90** | **451** | **311** | **66.00** | **175** | **0.37** | **270.52** | **1.16** | **4.29** | **0.18** | **1.52** | **0.47** | **24.05** | **0.90** | **5.40** | **0.10** | **0.10** | **0.90** | **0.10** | **1.66** |
| **49** | **25** | **37** | **35.4** | **39** | **28** | **11.4** | **1514** | **7.78** | **986** | **388** | **24.90** | **37.30** | **222.10** | **4.90** | **155** | **374** | **112.00** | **149** | **0.36** | **261.79** | **2.04** | **7.68** | **0.11** | **0.37** | **0.65** | **1.44** | **0.81** | **8.37** | **0.10** | **0.10** | **1.66** | **0.17** | **6.31** |
| **50** | **25** | **22** | **50.1** | **39** | **22** | **48.3** | **1234** | **7.12** | **800** | **347** | **118.53** | **26.61** | **93.91** | **26.06** | **155** | **299** | **42.50** | **132** | **0.10** | **71.42** | **266.86** | **1.16** | **17.99** | **5.54** | **1.07** | **101.02** | **1.72** | **2.28** | **0.10** | **0.10** | **17.10** | **0.10** | **0.61** |
| **51** | **25** | **25** | **58.6** | **39** | **23** | **17.3** | **892** | **7.46** | **576** | **405** | **107.83** | **13.87** | **57.81** | **7.30** | **95** | **272** | **11.90** | **69** | **0.18** | **175.26** | **37.09** | **5.24** | **2.62** | **0.80** | **0.73** | **1.05** | **0.44** | **2.69** | **0.10** | **0.10** | **1.44** | **0.10** | **0.68** |
| **52** | **26** | **6** | **56.4** | **38** | **50** | **39.6** | **574** | **7.80** | **373** | **326** | **54.70** | **9.10** | **53.50** | **3.00** | **31** | **204** | **42.00** | **45** | **0.22** | **112.71** | **0.89** | **2.63** | **0.10** | **0.39** | **0.53** | **1.23** | **0.95** | **1.34** | **0.10** | **0.10** | **31.09** | **0.10** | **2.63** |
| **53** | **25** | **55** | **13.2** | **39** | **9** | **25.3** | **3360** | **7.53** | **2170** | **174** | **105.70** | **16.00** | **300.30** | **1.70** | **158** | **423** | **66.00** | **380** | **0.85** | **649.07** | **0.82** | **0.96** | **0.16** | **0.33** | **0.88** | **1.66** | **2.29** | **8.35** | **0.10** | **0.10** | **18.54** | **0.14** | **7.37** |
| **54** | **25** | **49** | **48.3** | **39** | **12** | **22.2** | **10060** | **7.77** | **6510** | **330** | **189.20** | **512.60** | **1320.50** | **13.00** | **2245** | **394** | **450.00** | **1750** | **0.86** | **1237.48** | **2.03** | **5.55** | **0.23** | **2.10** | **3.62** | **4.72** | **3.43** | **50.06** | **0.10** | **0.10** | **12.25** | **0.10** | **3.63** |
| **55** | **25** | **51** | **20.9** | **38** | **58** | **54.7** | **5000** | **7.50** | **3250** | **2582** | **486.20** | **58.90** | **475.30** | **3.40** | **990** | **162** | **251.00** | **970** | **0.08** | **863.84** | **0.50** | **4.81** | **0.10** | **3.97** | **1.41** | **0.84** | **1.75** | **24.21** | **0.10** | **0.10** | **38.91** | **0.10** | **5.69** |
| **56** | **25** | **45** | **55.8** | **38** | **49** | **38.3** | **935** | **7.67** | **608** | **1456** | **77.40** | **15.00** | **71.30** | **1.90** | **105** | **167** | **56.00** | **113** | **0.86** | **198.53** | **2.14** | **1.78** | **0.10** | **0.79** | **0.22** | **1.05** | **1.01** | **3.26** | **0.10** | **0.10** | **41.32** | **0.10** | **2.77** |
| **57** | **25** | **48** | **50.1** | **39** | **14** | **5.5** | **1727** | **7.91** | **1121** | **352** | **30.80** | **69.00** | **228.50** | **5.10** | **166** | **570** | **57.00** | **156** | **0.96** | **232.35** | **0.50** | **2.99** | **0.10** | **0.31** | **0.45** | **0.96** | **1.41** | **3.92** | **0.10** | **0.10** | **11.75** | **0.10** | **3.96** |
| **58** | **25** | **32** | **54** | **38** | **42** | **53.4** | **3480** | **7.77** | **2260** | **367** | **74.40** | **56.70** | **640.00** | **14.20** | **850** | **290** | **32.00** | **530** | **0.92** | **686.25** | **0.50** | **2.38** | **0.10** | **0.88** | **0.83** | **1.56** | **1.71** | **7.41** | **0.10** | **0.10** | **30.91** | **0.10** | **5.15** |
| **59** | **25** | **33** | **16.6** | **38** | **41** | **53.2** | **4510** | **7.90** | **2930** | **419** | **86.60** | **84.20** | **745.00** | **16.20** | **940** | **265** | **35.00** | **820** | **0.89** | **640.23** | **0.50** | **3.98** | **0.10** | **0.95** | **1.02** | **2.68** | **1.64** | **7.70** | **0.10** | **0.10** | **29.02** | **0.10** | **4.07** |
| **60** | **25** | **31** | **25.2** | **38** | **44** | **3.7** | **4090** | **7.34** | **2670** | **563** | **179.40** | **130.40** | **461.04** | **2.90** | **760** | **257** | **4.73** | **850** | **0.41** | **450.50** | **3.69** | **4.60** | **0.91** | **3.41** | **0.94** | **2.18** | **3.64** | **8.66** | **0.10** | **0.10** | **10.99** | **0.10** | **2.36** |
| **61** | **25** | **17** | **3.8** | **39** | **20** | **47.1** | **8100** | **7.24** | **5250** | **1528** | **746.90** | **316.60** | **532.10** | **8.90** | **2512** | **221** | **62.20** | **595** | **0.59** | **375.94** | **3.16** | **1.57** | **0.34** | **16.29** | **2.63** | **3.10** | **2.82** | **9.84** | **0.10** | **0.10** | **86.95** | **0.18** | **2.16** |
| **62** | **25** | **19** | **0.4** | **39** | **21** | **8.3** | **5770** | **7.40** | **3750** | **3168** | **394.10** | **212.90** | **605.30** | **4.20** | **1479** | **195** | **208.00** | **725** | **0.61** | **329.38** | **3.55** | **0.92** | **0.69** | **8.32** | **9.69** | **3.69** | **1.88** | **14.26** | **0.10** | **0.10** | **8.03** | **0.28** | **2.31** |
| **63** | **25** | **8** | **17.7** | **39** | **30** | **56.7** | **554** | **7.10** | **359** | **1860** | **74.70** | **14.90** | **21.10** | **3.00** | **25** | **220** | **16.00** | **60** | **0.29** | **58.40** | **0.50** | **0.38** | **0.10** | **1.20** | **0.41** | **0.65** | **0.58** | **0.66** | **0.10** | **0.10** | **14.36** | **0.10** | **2.02** |
| **64** | **25** | **6** | **45.4** | **39** | **36** | **24.7** | **356** | **7.16** | **231** | **248** | **50.00** | **12.00** | **12.50** | **2.50** | **7** | **199** | **13.00** | **14** | **0.19** | **48.96** | **1.71** | **0.48** | **0.10** | **0.78** | **5.94** | **2.89** | **1.22** | **0.49** | **0.10** | **0.10** | **24.33** | **0.10** | **1.86** |
| **65** | **25** | **7** | **22** | **39** | **40** | **0.06** | **452** | **7.57** | **295** | **174** | **58.70** | **21.20** | **15.50** | **2.80** | **6** | **270** | **12.40** | **9** | **0.21** | **44.11** | **2.49** | **0.44** | **0.10** | **1.13** | **0.58** | **0.66** | **0.13** | **0.18** | **0.10** | **0.10** | **11.78** | **0.10** | **0.64** |
| **66** | **25** | **31** | **24.5** | **39** | **13** | **38.6** | **2000** | **6.54** | **1300** | **234** | **64.20** | **37.74** | **233.55** | **38.88** | **385** | **106** | **63.40** | **187** | **0.20** | **161.80** | **6.64** | **23.52** | **0.50** | **2.61** | **1.54** | **16.54** | **1.22** | **6.01** | **0.10** | **0.10** | **2.09** | **0.10** | **0.18** |
| **67** | **25** | **13** | **32.3** | **39** | **25** | **7.1** | **718** | **7.53** | **466** | **128** | **71.50** | **13.80** | **71.00** | **22.30** | **28** | **361** | **10.50** | **43** | **0.19** | **224.87** | **1.13** | **0.28** | **0.46** | **1.11** | **0.34** | **0.94** | **1.04** | **0.10** | **0.10** | **0.10** | **37.68** | **0.10** | **2.37** |
| **68** | **25** | **8** | **26.5** | **39** | **27** | **33.7** | **535** | **7.32** | **349** | **235** | **55.70** | **9.90** | **72.00** | **1.80** | **23** | **306** | **10.00** | **16** | **0.01** | **114.97** | **0.75** | **0.22** | **0.21** | **0.86** | **0.40** | **1.31** | **1.58** | **0.13** | **0.10** | **0.10** | **45.81** | **0.10** | **2.62** |
| **Min.** |  |  |  |  |  |  | **347** | **6.54** | **225** | **96** | **11.00** | **9.10** | **9.60** | **0.20** | **6** | **106** | **1.00** | **8** | **0.01** | **35.87** | **0.10** | **0.10** | **0.09** | **0.10** | **0.13** | **0.11** | **0.13** | **0.10** | **0.10** | **0.10** | **0.10** | **0.10** | **0.18** |
| **Max.** |  |  |  |  |  |  | **12870** | **8.07** | **8340** | **3168** | **746.90** | **711.60** | **2244.52** | **130.57** | **3700** | **876** | **450.00** | **2200** | **1.71** | **1888.38** | **266.86** | **78.93** | **735.85** | **34.77** | **9.69** | **123.31** | **25.39** | **110.72** | **0.42** | **0.49** | **311.13** | **18.97** | **21.20** |
| **Aver.** |  |  |  |  |  |  | **3426** | **7.43** | **2225** | **784** | **157.47** | **107.31** | **447.88** | **13.93** | **671** | **365** | **72.38** | **535** | **0.54** | **468.84** | **10.10** | **13.66** | **21.86** | **4.76** | **1.70** | **9.06** | **3.13** | **15.45** | **0.12** | **0.12** | **27.52** | **0.66** | **4.58** |

Supplementary Table 2 Results and classification of the pollution indices and parameters of irrigation.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S.N. | GWQI | Classif. | MI | Classif. | HPI | Classif. | SAR | Classif. | Na% | Classif. | MR | Classif. |
| 1 | 69.82 | Good | 0.71 | Pure | 6.12 | Low  | 3.21 | Excellent | 46.61 | Permissible | 33.72 | Suitable |
| 2 | 55.05 | Good | 0.63 | Pure | 3.85 | Low  | 1.48 | Excellent | 29.44 | Good | 28.11 | Suitable |
| 3 | 415.96 | Unsuitable | 2.55 | Moderately affected | 13.87 | Low  | 20.84 | Excellent | 72.82 | Doubtful | 45.41 | Suitable |
| 4 | 518.90 | Unsuitable | 2.43 | Moderately affected | 16.99 | Low  | 15.51 | Good | 61.47 | Doubtful | 53.88 | Suitable |
| 5 | 51.95 | Good | 0.55 | Pure | 4.53 | Low  | 1.49 | Excellent | 29.63 | Good | 22.19 | Suitable |
| 6 | 111.02 | Poor | 0.72 | Pure | 4.92 | Low  | 4.53 | Excellent | 46.33 | Permissible | 47.48 | Suitable |
| 7 | 79.33 | Good | 0.91 | Pure | 5.37 | Low  | 4.68 | Excellent | 54.63 | Permissible | 50.03 | Unsuitable |
| 8 | 110.40 | Poor | 1.43 | Slightly affected | 7.24 | Low  | 8.18 | Excellent | 69.15 | Doubtful | 33.61 | Suitable |
| 9 | 158.80 | Poor | 1.07 | Slightly affected | 6.01 | Low  | 5.00 | Excellent | 47.40 | Permissible | 35.09 | Suitable |
| 10 | 84.91 | Good | 2.94 | Moderately affected | 43.55 | Low  | 5.45 | Excellent | 56.62 | Permissible | 33.51 | Suitable |
| 11 | 90.47 | Good | 0.62 | Pure | 6.46 | Low  | 6.35 | Excellent | 62.62 | Doubtful | 48.15 | Suitable |
| 12 | 190.92 | Poor | 1.24 | Slightly affected | 12.19 | Low  | 15.32 | Good | 76.88 | Doubtful | 58.32 | Unsuitable |
| 13 | 176.76 | Poor | 0.89 | Pure | 7.24 | Low  | 5.22 | Excellent | 44.39 | Permissible | 19.68 | Suitable |
| 14 | 24.41 | Excellent  | 0.33 | Pure | 3.05 | Low  | 0.83 | Excellent | 24.49 | Good | 27.17 | Suitable |
| 15 | 24.25 | Excellent  | 0.30 | Pure | 2.90 | Low  | 0.30 | Excellent | 9.86 | Excellent | 20.93 | Suitable |
| 16 | 46.85 | Excellent  | 0.65 | Pure | 5.95 | Low  | 1.20 | Excellent | 24.44 | Good | 25.00 | Suitable |
| 17 | 49.79 | Excellent  | 0.97 | Pure | 9.79 | Low  | 1.92 | Excellent | 36.68 | Good | 17.56 | Suitable |
| 18 | 132.89 | Poor | 1.88 | Slightly affected | 17.22 | Low  | 5.97 | Excellent | 53.62 | Permissible | 20.12 | Suitable |
| 19 | 401.60 | Unsuitable | 3.66 | Moderately affected | 18.11 | Low  | 9.72 | Excellent | 49.91 | Permissible | 27.53 | Suitable |
| 20 | 50.17 | Good | 0.92 | Pure | 3.93 | Low  | 2.79 | Excellent | 48.75 | Permissible | 59.60 | Unsuitable |
| 21 | 66.44 | Good | 1.11 | Slightly affected | 6.21 | Low  | 4.81 | Excellent | 60.99 | Doubtful | 62.32 | Unsuitable |
| 22 | 94.25 | Good | 1.49 | Slightly affected | 3.88 | Low  | 3.05 | Excellent | 43.17 | Permissible | 69.26 | Unsuitable |
| 23 | 80.25 | Good | 11.64 | Seriously affected | 15.61 | Low  | 4.02 | Excellent | 53.75 | Permissible | 65.36 | Unsuitable |
| 24 | 128.99 | Poor | 2.51 | Moderately affected | 7.45 | Low  | 5.60 | Excellent | 55.96 | Permissible | 73.39 | Unsuitable |
| 25 | 190.66 | Poor | 2.78 | Moderately affected | 9.75 | Low  | 6.16 | Excellent | 51.07 | Permissible | 78.19 | Unsuitable |
| 26 | 295.87 | Very poor  | 4.12 | Strongly affected | 8.00 | Low  | 7.58 | Excellent | 49.87 | Permissible | 84.40 | Unsuitable |
| 27 | 256.95 | Very poor  | 5.81 | Strongly affected | 8.93 | Low  | 13.46 | Good | 68.99 | Doubtful | 81.31 | Unsuitable |
| 28 | 131.06 | Poor | 9.96 | Seriously affected | 8.30 | Low  | 7.44 | Excellent | 63.76 | Doubtful | 61.03 | Unsuitable |
| 29 | 67.86 | Good | 9.71 | Seriously affected | 14.51 | Low  | 12.74 | Good | 85.66 | Unsuitable | 71.46 | Unsuitable |
| 30 | 155.53 | Poor | 10.14 | Seriously affected | 11.70 | Low  | 9.03 | Excellent | 64.36 | Doubtful | 84.62 | Unsuitable |
| 31 | 154.22 | Poor | 12.11 | Seriously affected | 9.69 | Low  | 18.86 | Good | 84.29 | Unsuitable | 78.57 | Unsuitable |
| 32 | 131.32 | Poor | 12.15 | Seriously affected | 9.19 | Low  | 9.06 | Excellent | 69.95 | Doubtful | 78.86 | Unsuitable |
| 33 | 180.55 | Poor | 7.77 | Seriously affected | 9.69 | Low  | 16.52 | Good | 80.75 | Unsuitable | 71.53 | Unsuitable |
| 34 | 591.11 | Unsuitable | 5.13 | Strongly affected | 20.76 | Low  | 6.61 | Excellent | 33.09 | Good | 66.25 | Unsuitable |
| 35 | 318.26 | Unsuitable | 4.35 | Strongly affected | 14.02 | Low  | 5.59 | Excellent | 38.27 | Good | 51.08 | Unsuitable |
| 36 | 166.95 | Poor | 13.05 | Seriously affected | 41.37 | Low  | 3.56 | Excellent | 36.67 | Good | 43.87 | Suitable |
| 37 | 102.37 | Poor | 12.23 | Seriously affected | 9.47 | Low  | 1.83 | Excellent | 25.23 | Good | 43.15 | Suitable |
| 38 | 156.05 | Poor | 5.44 | Strongly affected | 10.37 | Low  | 6.00 | Excellent | 49.50 | Permissible | 47.63 | Suitable |
| 39 | 384.92 | Unsuitable | 3.12 | Moderately affected | 16.11 | Low  | 14.29 | Good | 65.41 | Doubtful | 39.47 | Suitable |
| 40 | 637.20 | Unsuitable | 4.79 | Strongly affected | 28.67 | Low  | 19.95 | Good | 65.85 | Doubtful | 60.19 | Unsuitable |
| 41 | 413.25 | Unsuitable | 3.84 | Moderately affected | 22.83 | Low  | 11.64 | Good | 54.96 | Permissible | 64.53 | Unsuitable |
| 42 | 295.44 | Very poor  | 6.13 | Seriously affected | 15.73 | Low  | 6.71 | Excellent | 42.96 | Permissible | 63.84 | Unsuitable |
| 43 | 141.86 | Poor | 13.15 | Seriously affected | 9.25 | Low  | 4.92 | Excellent | 47.36 | Permissible | 53.80 | Unsuitable |
| 44 | 119.36 | Poor | 16.38 | Seriously affected | 8.92 | Low  | 5.25 | Excellent | 56.81 | Permissible | 77.65 | Unsuitable |
| 45 | 100.71 | Poor | 14.31 | Seriously affected | 8.20 | Low  | 3.81 | Excellent | 45.08 | Permissible | 46.69 | Suitable |
| 46 | 31.32 | Excellent  | 0.28 | Very pure | 2.41 | Low  | 0.33 | Excellent | 9.52 | Excellent | 25.02 | Suitable |
| 47 | 85.05 | Good | 2.07 | Moderately affected | 4.79 | Low  | 5.04 | Excellent | 56.63 | Permissible | 52.01 | Unsuitable |
| 48 | 109.41 | Poor | 1.69 | Slightly affected | 5.47 | Low  | 5.76 | Excellent | 56.93 | Permissible | 55.74 | Unsuitable |
| 49 | 96.02 | Good | 2.13 | Moderately affected | 5.32 | Low  | 6.58 | Excellent | 68.52 | Doubtful | 71.19 | Unsuitable |
| 50 | 78.67 | Good | 2.65 | Moderately affected | 10.57 | Low  | 2.03 | Excellent | 31.77 | Good | 27.02 | Suitable |
| 51 | 46.31 | Excellent  | 1.26 | Slightly affected | 3.13 | Low  | 1.39 | Excellent | 27.26 | Good | 17.50 | Suitable |
| 52 | 39.76 | Excellent  | 0.87 | Pure | 3.91 | Low  | 0.30 | Excellent | 9.52 | Excellent | 21.53 | Suitable |
| 53 | 39.76 | Excellent  | 0.99 | Pure | 7.19 | Low  | 20.84 | Doubtful | 85.66 | Unsuitable | 19.98 | Suitable |
| 54 | 583.15 | Unsuitable | 3.02 | Moderately affected | 12.40 | Low  | 6.86 | Excellent | 50.79 | Permissible | 81.71 | Unsuitable |
| 55 | 279.65 | Very poor  | 2.11 | Moderately affected | 7.80 | Low  | 6.80 | Excellent | 50.06 | Permissible | 16.65 | Suitable |
| 56 | 59.29 | Good | 0.77 | Pure | 4.15 | Low  | 7.18 | Excellent | 51.16 | Permissible | 24.22 | Suitable |
| 57 | 98.43 | Good | 1.06 | Slightly affected | 5.01 | Low  | 6.90 | Excellent | 50.73 | Permissible | 78.70 | Unsuitable |
| 58 | 157.83 | Poor | 1.14 | Slightly affected | 5.97 | Low  | 6.73 | Excellent | 50.51 | Permissible | 55.69 | Unsuitable |
| 59 | 192.40 | Poor | 1.45 | Slightly affected | 5.88 | Low  | 6.84 | Excellent | 50.93 | Permissible | 61.59 | Unsuitable |
| 60 | 170.96 | Poor | 1.74 | Slightly affected | 8.63 | Low  | 6.89 | Excellent | 51.01 | Permissible | 54.52 | Unsuitable |
| 61 | 374.81 | Unsuitable | 1.39 | Slightly affected | 7.92 | Low  | 6.93 | Excellent | 50.93 | Permissible | 41.15 | Suitable |
| 62 | 313.82 | Unsuitable | 1.08 | Slightly affected | 6.88 | Low  | 6.90 | Excellent | 50.58 | Permissible | 47.12 | Suitable |
| 63 | 34.21 | Excellent  | 0.32 | Pure | 3.08 | Low  | 6.94 | Excellent | 50.65 | Permissible | 24.75 | Suitable |
| 64 | 24.46 | Excellent  | 0.45 | Pure | 4.08 | Low  | 6.97 | Excellent | 50.54 | Permissible | 28.36 | Suitable |
| 65 | 30.24 | Excellent  | 0.22 | Very pure | 2.17 | Low  | 6.98 | Excellent | 50.30 | Permissible | 37.33 | Suitable |
| 66 | 106.80 | Poor | 5.40 | Strongly affected | 6.46 | Low  | 6.82 | Excellent | 49.79 | Permissible | 49.23 | Suitable |
| 67 | 49.32 | Excellent  | 0.38 | Pure | 3.76 | Low  | 6.85 | Excellent | 49.91 | Permissible | 24.15 | Suitable |
| 68 | 29.85 | Excellent  | 0.44 | Pure | 4.59 | Low  | 6.97 | Excellent | 50.41 | Permissible | 22.67 | Suitable |
| Min. | 24.25 |  | 0.22 |  | 2.17 |  | 0.30 |  | 9.52 |  | 16.65 |  |
| Max. | 637.20 |  | 16.38 |  | 43.55 |  | 20.84 |  | 85.66 |  | 84.62 |  |
| Aver. | 169.98 |  | 3.83 |  | 10.07 |  | 7.08 |  | 50.55 |  | 48.07 |  |



Supplementary Fig. 1. Q-mode HCA for the groundwater wells.