**APPENDIX D**

# WaterConnect Bore Results and Underground service Plans

GOLDER

# WaterConnect Register Search

**Project Number:** 19131233
**Project:** Albert Park
**Site Address:** Albert Park
**Search Date:** 28/11/2019
**Prepared by:** JGC

**Acronyms**
EC: Electrical Conductivity (µS/cm)
TDS: Total Dissolved Solids (mg/L)
RWL: Relative standing water level
SWL: Standing water level

**Purpose**

| | | |
|---|---|---|
| APN: Anode Protection | FND: Foundations | REC: Recharge |
| APP: Appraisal | GEN: General Usage | RHL: Rock Hole |
| ASR: Aquifer Storage and Recovery | GTH: Geothermal Energy | RIV: River |
| CMT: Construction Materials | HOL: Water Hole | SCI: Scientific |
| COA: Coal | IND: Industrial | SEA: Sea Water |
| DAM: Dam | INV: Investigation | SEI: Seismic Status |
| DEP: Deepening | IRR: Irrigation | SOK: Soak |
| DEV: Development | LAK: Lake | SPR: Spring |
| DOM: Domestic | LWD: Liquid Waste Disposal | STK: Stock |
| DRN: Drainage | MON: Monitoring | TNK: Tank |
| DWT: Dewatering | MWS: Mine Water Supply | TWS: Town Water Supply |
| ENV: Environmental | OBS: Observation | UKN: Uknown |
| ETH: Earthing | PRO: Production | WAS: Waste Disposal |
| EXP: Exploration | RCL: Recreational | |
| FIR: Fire Fighting | RDC: Road Construction / Maintenance | |

**Status**

| | |
|---|---|
| ABD: Abandoned | NOP: Not Operational |
| BKF: Backfilled | UFL: Uncontrolled flowing |
| CFL: Controlled flowing | UKN: Unknown |
| NL: Not located | RHB: Rehabilitated |
| OPR: Operational | |

**Well Search Summary**

| | | |
|---|---|---|
| Search Radius: | | 2 km |
| Total number of wells: | | 735 |
| Number of onsite wells: | | 8 |
| Inferred shallow wells (<20 m): | | 632 |
| Salinity in wells (TDS in mg/L) | Min: | 121 |
| | Max: | 50540 |

| Unit_No | Drillhole | Aquifer | Max drill depth | Max drill date | Purpose | Latest status | Latest status date | SWL | RSWL | Water level date | TDS | EC | Salinity date | pH | pH date | Yield | Yield date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6628-10948 | WW | Qpah | 6.05 | 29/07/1979 | | | | 4.7 | 4.5 | 29/07/1979 | 121 | 220 | 29/07/1979 | 7 | 29/07/1979 | | |
| 6628-10948 | WW | Qpah | 6.05 | 29/07/1979 | | | | 4.7 | 4.5 | 29/07/1979 | 121 | 220 | 29/07/1979 | 7 | 29/07/1979 | | |
| 6628-11496 | WW | Qpah | 11.7 | 15/03/1980 | | BKF | | 3.6 | 1.4 | 15/03/1980 | 7513 | 13013 | 15/03/1980 | 8 | 15/03/1980 | 1 | 15/03/1980 |
| 6628-11496 | WW | Qpah | 11.7 | 15/03/1980 | | BKF | | 3.6 | 1.4 | 15/03/1980 | 7513 | 13013 | 15/03/1980 | 8 | 15/03/1980 | 1 | 15/03/1980 |
| 6628-11516 | WW | Tomw(T2) | 220 | 10/10/1980 | | BKF | 10/10/1980 | | | | 1524 | 2750 | 29/10/1980 | 8 | 29/10/1980 | | |
| 6628-11516 | WW | Tomw(T2) | 220 | 10/10/1980 | | BKF | 10/10/1980 | | | | 1524 | 2750 | 29/10/1980 | 8 | 29/10/1980 | | |
| 6628-11517 | WW | Tomw(T2) | 220 | 29/10/1980 | OBS | | | 1.5 | 1.4 | 29/06/1995 | 1126 | 2039 | 9/07/2012 | 8 | 16/03/1988 | 13 | 29/10/1980 |
| 6628-11517 | WW | Tomw(T2) | 220 | 29/10/1980 | OBS | | | 1.5 | 1.4 | 29/06/1995 | 1126 | 2039 | 9/07/2012 | 8 | 16/03/1988 | 13 | 29/10/1980 |
| 6628-11581 | WW | Qpah | 7.31 | 24/04/1979 | | | | 3.7 | 0.4 | 24/04/1979 | 6119 | 10700 | 24/04/1979 | 7 | 24/04/1979 | 2 | 24/04/1979 |
| 6628-11581 | WW | Qpah | 7.31 | 24/04/1979 | | | | 3.7 | 0.4 | 24/04/1979 | 6119 | 10700 | 24/04/1979 | 7 | 24/04/1979 | 2 | 24/04/1979 |
| 6628-11598 | WW | Qpah(Q1) | 9.14 | 7/03/1979 | OBS | | | 4.9 | 2.5 | 25/09/2019 | 3339 | 5950 | 5/09/2007 | 8 | 7/03/1979 | 2 | 7/03/1979 |
| 6628-11598 | WW | Qpah(Q1) | 9.14 | 7/03/1979 | OBS | | | 4.9 | 2.5 | 25/09/2019 | 3339 | 5950 | 5/09/2007 | 8 | 7/03/1979 | 2 | 7/03/1979 |
| 6628-11862 | WW | Qpah | 12.8 | 17/11/1981 | | BKF | | 2.4 | 0.6 | 17/11/1981 | 9091 | 15601 | 17/11/1981 | 8 | 17/11/1981 | 2 | 17/11/1981 |
| 6628-11862 | WW | Qpah | 12.8 | 17/11/1981 | | BKF | | 2.4 | 0.6 | 17/11/1981 | 9091 | 15601 | 17/11/1981 | 8 | 17/11/1981 | 2 | 17/11/1981 |
| 6628-11897 | WW | Qpah | 7.6 | 24/12/1981 | | | | 2.1 | 3.9 | 24/12/1981 | 2088 | 3754 | 24/12/1981 | 7 | 24/12/1981 | 1 | 24/12/1981 |
| 6628-11897 | WW | Qpah | 7.6 | 24/12/1981 | | | | 2.1 | 3.9 | 24/12/1981 | 2088 | 3754 | 24/12/1981 | 7 | 24/12/1981 | 1 | 24/12/1981 |
| 6628-12181 | WW | Qpah | 12.1 | 24/02/1983 | | BKF | | 4.8 | -0.8 | 24/02/1983 | 8472 | 14594 | 24/02/1983 | 7 | 24/02/1983 | 1 | 24/02/1983 |
| 6628-12181 | WW | Qpah | 12.1 | 24/02/1983 | | BKF | | 4.8 | -0.8 | 24/02/1983 | 8472 | 14594 | 24/02/1983 | 7 | 24/02/1983 | 1 | 24/02/1983 |
| 6628-12203 | WW | Qpah | 12.1 | 23/03/1983 | | | | 5.4 | 2.6 | 23/03/1983 | 2909 | 5200 | 23/03/1983 | 7 | 23/03/1983 | 1 | 23/03/1983 |
| 6628-12203 | WW | Qpah | 12.1 | 23/03/1983 | | | | 5.4 | 2.6 | 23/03/1983 | 2909 | 5200 | 23/03/1983 | 7 | 23/03/1983 | 1 | 23/03/1983 |
| 6628-12217 | WW | Qpah | 17 | 23/03/1983 | | | | 3.0 | | 23/03/1983 | 17629 | 28896 | 23/03/1983 | 7 | 23/03/1983 | 2 | 23/03/1983 |
| 6628-12217 | WW | Qpah | 17 | 23/03/1983 | | | | 3.0 | | 23/03/1983 | 17629 | 28896 | 23/03/1983 | 7 | 23/03/1983 | 2 | 23/03/1983 |
| 6628-12275 | WW | Qpah | 13.7 | 29/03/1983 | DOM | OPR | | 2.4 | 2.6 | 29/04/1983 | 2567 | 4600 | 29/03/1983 | 8 | 29/03/1983 | 1 | 29/04/1983 |
| 6628-12275 | WW | Qpah | 13.7 | 29/03/1983 | DOM | OPR | | 2.4 | 2.6 | 29/04/1983 | 2567 | 4600 | 29/03/1983 | 8 | 29/03/1983 | 1 | 29/04/1983 |
| 6628-12302 | WW | Qpah | 6.1 | 15/06/1983 | DOM | OPR | | | | | | | | | | | |
| 6628-12302 | WW | Qpah | 6.1 | 15/06/1983 | DOM | OPR | | | | | | | | | | | |
| 6628-12310 | WW | Qpah | 6 | 3/01/1983 | | | | 4.0 | 3.9 | 3/01/1983 | | | | | | | |
| 6628-12310 | WW | Qpah | 6 | 3/01/1983 | | | | 4.0 | 3.9 | 3/01/1983 | | | | | | | |
| 6628-12364 | WW | Qpah | 6 | 1/01/1983 | DOM | | | 4.2 | 3.8 | 1/01/1983 | 1720 | 3100 | 12/01/1983 | | | 1 | 1/01/1983 |
| 6628-12364 | WW | Qpah | 6 | 1/01/1983 | DOM | | | 4.2 | 3.8 | 1/01/1983 | 1720 | 3100 | 12/01/1983 | | | 1 | 1/01/1983 |
| 6628-12369 | WW | Qpah | 9 | 27/04/1983 | | | | 3.5 | 1.9 | 27/04/1983 | 1244 | 2250 | 26/04/1983 | 7 | 26/04/1983 | 11 | 27/04/1983 |
| 6628-12369 | WW | Qpah | 9 | 27/04/1983 | | | | 3.5 | 1.9 | 27/04/1983 | 1244 | 2250 | 26/04/1983 | 7 | 26/04/1983 | 11 | 27/04/1983 |
| 6628-12458 | WW | Qpah | 42.1 | 9/03/1981 | | | | | | | | | | | | | |
| 6628-12458 | WW | Qpah | 42.1 | 9/03/1981 | | | | | | | | | | | | | |
| 6628-12469 | WW | Qpah | 10.9 | 27/07/1983 | | BKF | | 1.8 | 2.2 | 27/07/1983 | 19474 | 31600 | 27/07/1983 | 8 | 27/07/1983 | 1 | 27/07/1983 |
| 6628-12469 | WW | Qpah | 10.9 | 27/07/1983 | | BKF | | 1.8 | 2.2 | 27/07/1983 | 19474 | 31600 | 27/07/1983 | 8 | 27/07/1983 | 1 | 27/07/1983 |
| 6628-12481 | WW | Qpah | 7.6 | 15/09/1982 | | BKF | | 2.7 | 4.4 | 15/09/1982 | | | | | | | |
| 6628-12481 | WW | Qpah | 7.6 | 15/09/1982 | | BKF | | 2.7 | 4.4 | 15/09/1982 | | | | | | | |
| 6628-12482 | WW | Qpah | 21.3 | 15/06/1983 | | ABD | | 3.6 | 0.4 | 15/06/1983 | 10162 | 17344 | 15/06/1983 | 7 | 15/06/1983 | 4 | 15/06/1983 |
| 6628-12482 | WW | Qpah | 21.3 | 15/06/1983 | | ABD | | 3.6 | 0.4 | 15/06/1983 | 10162 | 17344 | 15/06/1983 | 7 | 15/06/1983 | 4 | 15/06/1983 |
| 6628-12489 | WW | Qpah | 6 | 21/09/1983 | | | | | | | 2824 | 5050 | 21/09/1983 | 8 | 21/09/1983 | | |
| 6628-12489 | WW | Qpah | 6 | 21/09/1983 | | | | | | | 2824 | 5050 | 21/09/1983 | 8 | 21/09/1983 | | |
| 6628-12497 | WW | Qpah | 6.5 | 28/09/1983 | | | | 3.0 | 1.0 | 28/09/1983 | 3195 | 5700 | 28/09/1983 | 8 | 28/09/1983 | 1 | 28/09/1983 |
| 6628-12497 | WW | Qpah | 6.5 | 28/09/1983 | | | | 3.0 | 1.0 | 28/09/1983 | 3195 | 5700 | 28/09/1983 | 8 | 28/09/1983 | 1 | 28/09/1983 |
| 6628-12525 | WW | Qpah | 12.1 | 17/10/1983 | DOM | OPR | | 2.0 | 2.0 | 17/10/1983 | 3137 | 5600 | 17/10/1983 | 8 | 17/10/1983 | 1 | 17/10/1983 |
| 6628-12525 | WW | Qpah | 12.1 | 17/10/1983 | DOM | OPR | | 2.0 | 2.0 | 17/10/1983 | 3137 | 5600 | 17/10/1983 | 8 | 17/10/1983 | 1 | 17/10/1983 |
| 6628-12953 | WW | Qpah | 5 | 1/01/1984 | | | | 3.0 | 3.2 | 1/01/1984 | | | | | | | |
| 6628-12953 | WW | Qpah | 5 | 1/01/1984 | | | | 3.0 | 3.2 | 1/01/1984 | | | | | | | |
| 6628-13008 | WW, ENG | Qpah(Q1) | 10.3 | 8/03/1984 | INVOBS | ABD | 8/03/1984 | 4.1 | 2.7 | 19/06/1990 | 2216 | 3980 | 8/03/1984 | 8 | 8/03/1984 | | |
| 6628-13008 | WW, ENG | Qpah(Q1) | 10.3 | 8/03/1984 | INVOBS | ABD | 8/03/1984 | 4.1 | 2.7 | 19/06/1990 | 2216 | 3980 | 8/03/1984 | 8 | 8/03/1984 | | |
| 6628-13039 | WW | Qhck | 3.9 | 3/09/1984 | DOM | OPR | | 2.4 | -0.4 | 3/09/1984 | | | | | | 1 | 3/09/1984 |
| 6628-13039 | WW | Qhck | 3.9 | 3/09/1984 | DOM | OPR | | 2.4 | -0.4 | 3/09/1984 | | | | | | 1 | 3/09/1984 |
| 6628-13173 | WW | Qhck | 6 | 7/02/1985 | DOM | OPR | | 3.0 | -1.0 | 7/02/1985 | 1810 | 3260 | 7/02/1985 | 6 | 7/02/1985 | 1 | 7/02/1985 |
| 6628-13173 | WW | Qhck | 6 | 7/02/1985 | DOM | OPR | | 3.0 | -1.0 | 7/02/1985 | 1810 | 3260 | 7/02/1985 | 6 | 7/02/1985 | 1 | 7/02/1985 |
| 6628-13178 | WW | Qhck | 5 | 15/02/1985 | | | | 3.0 | -1.0 | 15/02/1985 | 3464 | 6168 | 15/02/1985 | 8 | 15/02/1985 | 1 | 15/02/1985 |
| 6628-13178 | WW | Qhck | 5 | 15/02/1985 | | | | 3.0 | -1.0 | 15/02/1985 | 3464 | 6168 | 15/02/1985 | 8 | 15/02/1985 | 1 | 15/02/1985 |
| 6628-13285 | WW | Qpah | 14.6 | 19/02/1985 | | | | 2.0 | 6.0 | 19/02/1985 | 2567 | 4600 | 19/02/1985 | 8 | 19/02/1985 | 2 | 19/02/1985 |
| 6628-13285 | WW | Qpah | 14.6 | 19/02/1985 | | | | 2.0 | 6.0 | 19/02/1985 | 2567 | 4600 | 19/02/1985 | 8 | 19/02/1985 | 2 | 19/02/1985 |
| 6628-13292 | WW | Qpah | 26 | 22/03/1985 | | | | | | | 2001 | 3600 | 11/04/1985 | 7 | 11/04/1985 | 3 | 22/03/1985 |
| 6628-13292 | WW | Qpah | 26 | 22/03/1985 | | | | | | | 2001 | 3600 | 11/04/1985 | 7 | 11/04/1985 | 3 | 22/03/1985 |
| 6628-13306 | WW | Qpah | 22 | 24/03/1985 | | | | 2.0 | 2.0 | 24/03/1985 | 2591 | 4640 | 23/05/1985 | 8 | 23/05/1985 | 1 | 24/03/1985 |
| 6628-13306 | WW | Qpah | 22 | 24/03/1985 | | | | 2.0 | 2.0 | 24/03/1985 | 2591 | 4640 | 23/05/1985 | 8 | 23/05/1985 | 1 | 24/03/1985 |
| 6628-13336 | WW | Qhck | 6 | 5/06/1985 | | | | 3.0 | | 5/06/1985 | 8343 | 14399 | 5/06/1985 | 7 | 5/06/1985 | 1 | 5/06/1985 |
| 6628-13336 | WW | Qhck | 6 | 5/06/1985 | | | | 3.0 | | 5/06/1985 | 8343 | 14399 | 5/06/1985 | 7 | 5/06/1985 | 1 | 5/06/1985 |
| 6628-13368 | WW | Tomw(T1) | 198 | 8/07/1985 | IRR | OPR | | 8.0 | 1.0 | 8/07/1985 | 1586 | 2860 | 23/10/2012 | 8 | 1/08/1985 | 8 | |
| 6628-13368 | WW | Tomw(T1) | 198 | 8/07/1985 | IRR | OPR | | 8.0 | 1.0 | 8/07/1985 | 1586 | 2860 | 23/10/2012 | 8 | 1/08/1985 | 8 | |
| 6628-13423 | WW | Qhck | 4.7 | 19/08/1985 | DOM | OPR | | 2.1 | -0.1 | 5/09/1985 | 637 | 1156 | 5/09/1985 | 8 | 19/08/1985 | 1 | |
| 6628-13423 | WW | Qhck | 4.7 | 19/08/1985 | DOM | OPR | | 2.1 | -0.1 | 5/09/1985 | 637 | 1156 | 5/09/1985 | 8 | 19/08/1985 | 1 | |
| 6628-13424 | WW | Qpah | 10.5 | 30/06/1985 | | | | 3.5 | 1.6 | 12/08/1985 | 2852 | 5100 | 12/08/1985 | 8 | 30/06/1985 | | |
| 6628-13424 | WW | Qpah | 10.5 | 30/06/1985 | | | | 3.5 | 1.6 | 12/08/1985 | 2852 | 5100 | 12/08/1985 | 8 | 30/06/1985 | | |
| 6628-13451 | WW | Qpah | 6 | 12/09/1985 | | | | 3.0 | 2.0 | 12/09/1985 | 2756 | 4930 | 19/09/1985 | 8 | 19/09/1985 | 1 | |
| 6628-13451 | WW | Qpah | 6 | 12/09/1985 | | | | 3.0 | 2.0 | 12/09/1985 | 2756 | 4930 | 19/09/1985 | 8 | 19/09/1985 | 1 | |
| 6628-13484 | WW | Qpah | 6.09 | 1/08/1985 | IRR | OPR | | 4.6 | 5.1 | 25/10/1985 | 2182 | 3920 | 1/08/1985 | 8 | 1/08/1985 | | |
| 6628-13484 | WW | Qpah | 6.09 | 1/08/1985 | IRR | OPR | | 4.6 | 5.1 | 25/10/1985 | 2182 | 3920 | 1/08/1985 | 8 | 1/08/1985 | | |
| 6628-13485 | WW | Qpah | 16 | 24/10/1985 | DOM | OPR | | 3.0 | 4.5 | 24/10/1985 | 2828 | 5057 | 24/10/1985 | 8 | 24/10/1985 | | |
| 6628-13485 | WW | Qpah | 16 | 24/10/1985 | DOM | OPR | | 3.0 | 4.5 | 24/10/1985 | 2828 | 5057 | 24/10/1985 | 8 | 24/10/1985 | | |
| 6628-13613 | WW | Qpah | 9.1 | 24/03/1986 | | | | 2.4 | 4.6 | 16/04/1986 | 2113 | 3799 | 1/03/1986 | 7 | 1/03/1986 | 1 | 24/03/1986 |
| 6628-13613 | WW | Qpah | 9.1 | 24/03/1986 | | | | 2.4 | 4.6 | 16/04/1986 | 2113 | 3799 | 1/03/1986 | 7 | 1/03/1986 | 1 | 24/03/1986 |
| 6628-13615 | WW | Qpah | 7.3 | 3/04/1986 | | | | 3.4 | 0.6 | 16/04/1986 | 2160 | 3880 | 3/04/1986 | 7 | 3/04/1986 | 1 | 3/04/1986 |
| 6628-13615 | WW | Qpah | 7.3 | 3/04/1986 | | | | 3.4 | 0.6 | 16/04/1986 | 2160 | 3880 | 3/04/1986 | 7 | 3/04/1986 | 1 | 3/04/1986 |
| 6628-13692 | WW | Qpah | 8 | 5/07/1986 | | | | 4.0 | 3.8 | 5/07/1986 | | | | | | | |
| 6628-13692 | WW | Qpah | 8 | 5/07/1986 | | | | 4.0 | 3.8 | 5/07/1986 | | | | | | | |
| 6628-13831 | WW | Qpah | 11 | 21/11/1986 | | | | 4.3 | 3.7 | 17/12/1986 | 1917 | 3450 | 17/12/1986 | 8 | 21/11/1986 | 1 | 21/11/1986 |
| 6628-13831 | WW | Qpah | 11 | 21/11/1986 | | | | 4.3 | 3.7 | 17/12/1986 | 1917 | 3450 | 17/12/1986 | 8 | 21/11/1986 | 1 | 21/11/1986 |
| 6628-13832 | WW | Qpah | 9.1 | 21/11/1986 | | | | 3.7 | 4.3 | 17/12/1986 | 2874 | 5138 | 17/12/1986 | 8 | 21/11/1986 | 1 | 21/11/1986 |
| 6628-13832 | WW | Qpah | 9.1 | 21/11/1986 | | | | 3.7 | 4.3 | 17/12/1986 | 2874 | 5138 | 17/12/1986 | 8 | 21/11/1986 | 1 | 21/11/1986 |
| 6628-13860 | WW | Qpah | 4.7 | 15/01/1987 | | | | 2.8 | 1.9 | 27/01/1986 | | | | | | | |
| 6628-13860 | WW | Qpah | 4.7 | 15/01/1987 | | | | 2.8 | 1.9 | 27/01/1986 | | | | | | | |
| 6628-13876 | WW | Tomw(T1) | 199.3 | 7/02/1987 | IRR | | | 1.4 | 3.4 | 5/08/2019 | 822 | 1491 | 5/08/2019 | 8 | 5/08/2019 | 8 | 1/01/1978 |
| 6628-13876 | WW | Tomw(T1) | 199.3 | 7/02/1987 | IRR | | | 1.4 | 3.4 | 5/08/2019 | 822 | 1491 | 5/08/2019 | 8 | 5/08/2019 | 8 | 1/01/1978 |
| 6628-13902 | WW | Qpah | 14.6 | 23/02/1987 | DRN | | | 6.1 | -0.1 | 11/03/1987 | | | | | | 1 | 23/02/1987 |
| 6628-13902 | WW | Qpah | 14.6 | 23/02/1987 | DRN | | | 6.1 | -0.1 | 11/03/1987 | | | | | | 1 | 23/02/1987 |
| 6628-13962 | WW | Qpah | 6 | 1/02/1987 | DRN | | | 5.0 | 1.9 | 17/06/1987 | 200 | 364 | 17/06/1987 | 7 | 6/06/1987 | | |
| 6628-13962 | WW | Qpah | 6 | 1/02/1987 | DRN | | | 5.0 | 1.9 | 17/06/1987 | 200 | 364 | 17/06/1987 | 7 | 6/06/1987 | | |
| 6628-13969 | WW | Qpah | 6.09 | 20/05/1987 | | | | 1.8 | 1.2 | 1/07/1987 | 420 | 764 | 1/07/1987 | 8 | 20/05/1987 | 1 | 20/05/1987 |
| 6628-13969 | WW | Qpah | 6.09 | 20/05/1987 | | | | 1.8 | 1.2 | 1/07/1987 | 420 | 764 | 1/07/1987 | 8 | 20/05/1987 | 1 | 20/05/1987 |
| 6628-14172 | WW | Qpah | 9 | 4/02/1988 | | | | 2.5 | 3.5 | 11/03/1988 | 3559 | 6333 | 11/03/1988 | 8 | 4/02/1988 | 1 | 4/02/1988 |
| 6628-14172 | WW | Qpah | 9 | 4/02/1988 | | | | 2.5 | 3.5 | 11/03/1988 | 3559 | 6333 | 11/03/1988 | 8 | 4/02/1988 | 1 | 4/02/1988 |
| 6628-14240 | WW | Qpah | 10 | 9/05/1988 | DOM | OPR | | 2.4 | 2.6 | 14/07/1988 | 3482 | 6200 | 14/07/1988 | 7 | 9/05/1988 | 1 | 9/05/1988 |
| 6628-14240 | WW | Qpah | 10 | 9/05/1988 | DOM | OPR | | 2.4 | 2.6 | 14/07/1988 | 3482 | 6200 | 14/07/1988 | 7 | 9/05/1988 | 1 | 9/05/1988 |
| 6628-14256 | WW | Qhck | 8.5 | 24/08/1988 | | | | 1.6 | 1.4 | 20/09/1988 | 3109 | 5550 | 20/09/1988 | 8 | 29/07/1988 | 2 | 24/08/1988 |

GOLDER

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| Number of onsite wells: | | 8 |
| Inferred shallow wells (<20 m): | | 632 |
| Salinity in wells (TDS in mg/L) | Min: | 121 |
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| Unit_No | Drillhole | Aquifer | Max drill depth | Max drill date | Purpose | Latest status | Latest status date | SWL | RSWL | Water level date | TDS | EC | Salinity date | pH | pH date | Yield | Yield date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6628-14256 | WW | Qhck | 8.5 | 24/08/1988 | | | | 1.6 | 1.4 | 20/09/1988 | 3109 | 5550 | 20/09/1988 | 8 | 29/07/1988 | 2 | 24/08/1988 |
| 6628-14406 | WW | Qpah | 7.9 | 24/04/1989 | DRN | OPR | | 3.6 | 0.4 | 7/06/1989 | 5827 | 10207 | 7/06/1989 | 8 | 24/04/1989 | 1 | 24/04/1989 |
| 6628-14406 | WW | Qpah | 7.9 | 24/04/1989 | DRN | OPR | | 3.6 | 0.4 | 7/06/1989 | 5827 | 10207 | 7/06/1989 | 8 | 24/04/1989 | 1 | 24/04/1989 |
| 6628-14408 | WW | Qpah | 9.1 | 3/06/1989 | DOM | OPR | | 3.4 | 0.6 | 7/06/1989 | 6453 | 11261 | 7/06/1989 | 8 | 3/06/1989 | 2 | 3/06/1989 |
| 6628-14408 | WW | Qpah | 9.1 | 3/06/1989 | DOM | OPR | | 3.4 | 0.6 | 7/06/1989 | 6453 | 11261 | 7/06/1989 | 8 | 3/06/1989 | 2 | 3/06/1989 |
| 6628-14599 | ENG | Qpah | 10.5 | 6/03/1984 | INV | ABD | 6/03/1984 | | | | | | | | | | |
| 6628-14599 | ENG | Qpah | 10.5 | 6/03/1984 | INV | ABD | 6/03/1984 | | | | | | | | | | |
| 6628-14600 | ENG | Qpah | 10.5 | 6/03/1984 | INV | ABD | 6/03/1984 | | | | | | | | | | |
| 6628-14600 | ENG | Qpah | 10.5 | 6/03/1984 | INV | ABD | 6/03/1984 | | | | | | | | | | |
| 6628-14601 | ENG | | 10.65 | 7/03/1984 | INV | ABD | 7/03/1984 | | | | | | | | | | |
| 6628-14601 | ENG | | 10.65 | 7/03/1984 | INV | ABD | 7/03/1984 | | | | | | | | | | |
| 6628-14602 | ENG | Qpah | 10.5 | 7/03/1984 | INV | ABD | 7/03/1984 | | | | | | | | | | |
| 6628-14602 | ENG | Qpah | 10.5 | 7/03/1984 | INV | ABD | 7/03/1984 | | | | | | | | | | |
| 6628-15148 | WW | Qpah | 9 | 2/01/1990 | DOM | OPR | | 3.8 | 2.2 | 25/01/1990 | 2899 | 5182 | 25/01/1990 | | | 0 | 2/01/1990 |
| 6628-15148 | WW | Qpah | 9 | 2/01/1990 | DOM | OPR | | 3.8 | 2.2 | 25/01/1990 | 2899 | 5182 | 25/01/1990 | | | 0 | 2/01/1990 |
| 6628-15208 | WW | Qpah | 10 | 3/02/1990 | DOM | OPR | | 6.0 | -2.0 | 28/02/1990 | 9873 | 16882 | 28/02/1990 | 8 | 3/02/1990 | 0 | 3/02/1990 |
| 6628-15246 | WW | Qpah | 8 | 1/12/1989 | DOM | OPR | | 4.0 | 3.8 | 13/12/1989 | 2036 | 3661 | 13/12/1989 | 7 | 12/11/1989 | | 1/12/1989 |
| 6628-15322 | WW | Tomw(T1) | 207 | 18/07/1990 | IRR | OPR | 18/07/1990 | | 8.8 | 15/08/1990 | 657 | 1192 | 22/08/2014 | 8 | 26/07/1990 | | 15/08/1990 |
| 6628-15420 | WW | Qhck | 9 | 10/01/1991 | DOM | OPR | | 4.0 | 0.8 | 10/01/1991 | 13671 | 22879 | 10/01/1991 | 8 | 10/01/1991 | | |
| 6628-15421 | WW | Qpah | 10.5 | 4/01/1991 | | | | 2.1 | 4.9 | 4/01/1991 | 6811 | 11865 | 4/01/1991 | 8 | 4/01/1991 | 2 | 4/01/1991 |
| 6628-15495 | WW | Qpah | 6 | 8/03/1991 | DRN | OPR | | 2.4 | 4.1 | 3/04/1991 | | | | | | | |
| 6628-15513 | WW | Qpah | 7 | 21/01/1991 | OBS | OPR | | 3.0 | 4.6 | 7/12/1990 | 2149 | 3861 | 7/12/1990 | 7 | 7/12/1990 | | |
| 6628-15546 | WW | Qpah | 7 | 20/03/1991 | DOM | OPR | | 3.5 | 3.8 | 5/04/1991 | 2858 | 5109 | 5/04/1991 | 8 | 20/03/1991 | | |
| 6628-15577 | WW | Qpah | 9 | 25/05/1991 | DOM | OPR | | 4.3 | 4.7 | 13/06/1991 | 2042 | 3672 | 13/06/1991 | 8 | 25/05/1991 | 1 | 25/05/1991 |
| 6628-15578 | WW | Qpah | 9 | 25/05/1991 | DOM | OPR | | 4.5 | 2.5 | 13/06/1991 | 1968 | 3540 | 13/06/1991 | 8 | 25/05/1991 | 1 | 25/05/1991 |
| 6628-15593 | WW | Qpah | 12 | 3/08/1991 | DOM | OPR | | 4.7 | 2.6 | 22/08/1991 | 2619 | 4691 | 22/08/1991 | 8 | 3/08/1991 | 2 | 3/08/1991 |
| 6628-15607 | WW | Qpah | 9 | 17/09/1991 | | BKF | | 1.6 | 3.5 | 23/09/1991 | 22450 | 35947 | 23/09/1991 | 8 | 17/09/1991 | 2 | 17/09/1991 |
| 6628-15616 | WW | Qpah | 8 | 5/09/1991 | DOM | OPR | | 2.5 | 3.4 | 5/09/1991 | | | | | | | |
| 6628-15630 | WW | Qpah | 9.3 | 18/09/1991 | DOM | OPR | | 2.1 | 3.9 | 18/09/1991 | 7023 | 12209 | 18/09/1991 | 7 | 18/09/1991 | 2 | 18/09/1991 |
| 6628-15679 | WW | Qpah | 6 | 2/11/1990 | DOM | OPR | | 2.5 | 3.1 | 2/11/1990 | 2756 | 4930 | 2/11/1990 | 8 | 2/11/1990 | | |
| 6628-15682 | WW | Tomw(T1) | 200 | 22/08/1991 | IRR | BKF | 22/06/2006 | 8.4 | -3.6 | 22/08/1991 | 948 | 1716 | 11/08/2006 | 8 | 22/08/1991 | 12 | 22/08/1991 |
| 6628-15793 | WW | Tomw(T1) | 125.5 | 19/12/1991 | IND | OPR | | 16.3 | -11.8 | 19/12/1991 | 1425 | 2574 | 20/12/1964 | 8 | 20/12/1964 | 2 | 19/12/1991 |
| 6628-15810 | WW | Qpah | 9 | 20/12/1991 | DOM | OPR | | | 4.8 | 3/01/1992 | 3673 | 6530 | 3/01/1992 | 7 | 20/12/1991 | | |
| 6628-15871 | WW | Qpah | 15 | 30/01/1992 | DOM | OPR | | 6.0 | 4.1 | 31/01/1992 | 2042 | 3672 | 31/01/1992 | 7 | 30/01/1992 | | |
| 6628-15914 | WW | Qpah | 13 | 19/02/1992 | DOM | OPR | | 5.0 | -0.3 | 9/03/1992 | 17320 | 28439 | 9/03/1992 | 7 | 19/02/1992 | | |
| 6628-15948 | WW | Qpah | 7.5 | 27/02/1992 | DOM | OPR | | 4.0 | 1.0 | 24/03/1992 | 5087 | 8962 | 24/03/1992 | 8 | 27/02/1992 | 1 | 27/02/1992 |
| 6628-15988 | WW | Qpah | 6 | 12/04/1992 | DOM | OPR | | 3.0 | 1.3 | 15/04/1992 | 4270 | 7562 | 15/04/1992 | 8 | 12/04/1992 | | |
| 6628-15989 | WW | Qpah | 18 | 28/03/1992 | DOM | OPR | | 4.8 | 3.2 | 13/04/1992 | 3546 | 6309 | 13/04/1992 | 7 | 28/03/1992 | | |
| 6628-16121 | WW | Qpah | 11.2 | 6/07/1992 | DOM | OPR | | 4.3 | 5.4 | 6/07/1992 | 2182 | 3920 | 6/07/1992 | 7 | 6/07/1992 | 1 | 6/07/1992 |
| 6628-16198 | WW | Qpah | 6 | 15/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16199 | WW | Qpah | 6 | 13/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16200 | WW | Qpah | 6 | 20/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16201 | WW | Qpah | 6 | 13/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16202 | WW | Qpah | 6 | 14/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16203 | WW | Qpah | 6 | 20/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16204 | WW | Qpah | 6 | 20/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16205 | WW | Qpah | 6 | 13/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16206 | WW | Qpah | 6 | 13/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16207 | WW | Qpah | 6 | 13/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16208 | WW | Qpah | 6 | 13/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16209 | WW | Qpah | 6 | 13/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16210 | WW | Qpah | 6 | 13/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16211 | WW | Qpah | 6 | 13/08/1992 | OBS | | | | | | | | | | | | |
| 6628-16212 | WW | Qpah | 6 | 1/10/1992 | OBS | | | | | | | | | | | | |
| 6628-16213 | WW | Qpah | 6 | 1/10/1992 | OBS | | | | | | | | | | | | |
| 6628-16214 | WW | Qpah | 6 | 1/10/1992 | OBS | | | 2.5 | 2.3 | 1/10/1992 | | | | | | | |
| 6628-16219 | WW | Qpah | 14 | 15/01/1993 | DOM | | | 5.0 | 4.9 | 29/01/1993 | 2618 | 4690 | 29/01/1993 | 7 | 29/01/1993 | 1 | 15/01/1993 |
| 6628-16226 | WW | Qpah | 9 | 25/01/1993 | DRN | | | 4.0 | 3.1 | 17/02/1993 | 3030 | 5410 | 17/02/1993 | 8 | 17/02/1993 | 1 | 25/01/1993 |
| 6628-16253 | WW | Tomw(T1) | 126 | 25/01/1993 | IND | | | 16.0 | -11.8 | 25/01/1993 | 1575 | 2840 | 22/01/1993 | 8 | 22/01/1993 | 5 | 25/01/1993 |
| 6628-16431 | WW | Qpah | 12 | 16/06/1993 | DOM | | | 3.0 | 1.8 | 29/09/1993 | 1552 | 2800 | 29/09/1993 | 8 | 29/09/1993 | | |
| 6628-16612 | WW | Qpah | 18 | 6/04/1994 | DOM | | | | | | 1962 | 3530 | 5/04/1994 | 7 | 5/04/1994 | | |
| 6628-16673 | WW | Qpah | 18 | 28/05/1994 | DOM | | | | | | 4782 | 8440 | 8/06/1994 | 7 | 8/06/1994 | | |
| 6628-16716 | WW | Qpah | 6 | 1/06/1992 | DOM | | | 3.0 | 1.3 | 1/06/1992 | 2092 | 3760 | 10/06/1992 | 7 | 10/06/1992 | | |
| 6628-16777 | WW | Qpah | 16.5 | 30/09/1994 | DRN | | | | | | 1782 | 3210 | 30/09/1994 | 7 | 30/09/1994 | | |
| 6628-16806 | WW | Qpah | 11 | 8/12/1994 | DOM | | | | | | 3926 | 6970 | 8/12/1994 | 7 | 8/12/1994 | | |
| 6628-16877 | WW | Qpah | 18.5 | 16/02/1995 | DOM | | | | | | 2307 | 4140 | 16/02/1995 | 7 | 16/02/1995 | | |
| 6628-16954 | WW | Qpah | 16.5 | 16/02/1995 | DOM | | | | | | 2290 | 4110 | 16/02/1995 | 7 | 16/02/1995 | | |
| 6628-16955 | WW | Qpah | 16 | 2/03/1995 | DOM | | | | | | 6062 | 10600 | 2/03/1995 | 7 | 2/03/1995 | | |
| 6628-17004 | ENG | Qpah | 10.1 | | | | | | | | | | | | | | |
| 6628-17008 | ENG | Qpah | 13.5 | | | | | | | | | | | | | | |
| 6628-17029 | ENG | Qpah | 8.91 | | | | | | | | | | | | | | |
| 6628-17032 | ENG | Qpah | 8.46 | | | | | | | | | | | | | | |
| 6628-17157 | WW | Qpah | 18 | 6/03/1995 | DOM | | | | | | 3437 | 6120 | 6/03/1995 | 7 | 6/03/1995 | | |
| 6628-17236 | WW | Qpah | 20 | 2/05/1995 | DOM | | | | | | 2875 | 5141 | | 7 | | 5 | 2/05/1995 |
| 6628-17270 | WW | Qpah | 6.4 | 7/06/1995 | DOM | | | | | | 1917 | 3450 | 7/06/1995 | 7 | 7/06/1995 | | |
| 6628-17312 | WW | Qpah | 6.7 | 15/02/1995 | DOM | ABD | 15/02/1995 | | | | 6062 | 10600 | 15/02/1995 | 8 | 15/02/1995 | | |
| 6628-17444 | WW | Qpah | 15 | 14/11/1995 | DOM | | | | | | 2165 | 3890 | 14/11/1995 | 7 | 14/11/1995 | | |
| 6628-17495 | WW | Qpah | 15 | 30/12/1995 | DOM | | | | | | 6338 | 11060 | 30/12/1995 | 7 | 30/12/1995 | | |
| 6628-17496 | WW | Qpah | 13.5 | 21/12/1995 | DOM | | | | | | 20063 | 32500 | 21/12/1995 | 7 | 21/12/1995 | 1 | 21/12/1995 |
| 6628-17499 | WW | Qpah | 12 | 15/12/1995 | DOM | | | | | | 2188 | 3930 | 15/12/1995 | 7 | 15/12/1995 | 1 | 15/12/1995 |
| 6628-17637 | WW | Qpah | 8.2 | 17/01/1996 | OBS | | | | | | | | | | | | |
| 6628-17638 | WW | Qpah | 8 | 17/01/1996 | OBS | | | | | | | | | | | | |
| 6628-17769 | WW | Qpah | 6 | 23/08/1995 | OBS | | | 3.2 | 1.3 | 23/08/1995 | 2143 | 3850 | 23/08/1995 | 8 | 23/08/1995 | | |
| 6628-17770 | WW | Qpah | 6 | 23/08/1995 | OBS | | | 3.7 | 0.8 | 23/08/1995 | 2290 | 4110 | 23/08/1995 | 8 | 23/08/1995 | | |
| 6628-17771 | WW | Qpah | 6 | 24/08/1995 | OBS | | | 3.8 | 0.8 | 24/08/1995 | 6751 | 11760 | 24/08/1995 | 8 | 24/08/1995 | | |
| 6628-17772 | WW | Qpah | 4.5 | 23/08/1995 | OBS | | | 3.2 | 1.3 | 23/08/1995 | 2239 | 4020 | 23/08/1995 | 7 | 23/08/1995 | | |
| 6628-17773 | WW | Qpah | 6 | 23/08/1995 | OBS | | | 3.4 | 1.2 | 23/08/1995 | 4147 | 7350 | 23/08/1995 | 8 | 23/08/1995 | | |
| 6628-17774 | WW | Qpah | 6 | 24/08/1995 | OBS | | | 3.2 | 1.3 | 24/08/1995 | 3246 | 5790 | 24/08/1995 | 8 | 24/08/1995 | | |
| 6628-17791 | WW | Qpah | 16 | 26/03/1996 | DOM | | | | | | 2949 | 5270 | 26/03/1996 | 7 | 26/03/1996 | 1 | 26/03/1996 |
| 6628-17862 | WW | Qpah | 12.5 | 10/04/1996 | DOM | | | | | | 2143 | 3850 | 10/04/1996 | 7 | 10/04/1996 | 1 | 10/04/1996 |
| 6628-17963 | WW | Qpah | 15 | 30/08/1996 | DOM | | | | | | 3522 | 6270 | 30/08/1996 | 7 | 30/08/1996 | 1 | 30/08/1996 |
| 6628-18105 | WW | Qpah | 15 | 19/11/1996 | DOM | | | 6.0 | 3.9 | 19/11/1996 | 2323 | 4170 | 19/11/1996 | | | 1 | 19/11/1996 |
| 6628-18223 | WW | Qpah | 12 | 24/12/1996 | DOM | | | 3.3 | 1.6 | 24/12/1996 | 4130 | 7320 | 27/12/1996 | | | 1 | 24/12/1996 |
| 6628-18224 | WW | Qpah | 18 | 5/02/1997 | DOM | | | 5.4 | -0.3 | 5/02/1997 | 4688 | 8280 | 5/02/1997 | | | 1 | 5/02/1997 |
| 6628-18239 | WW | Qpah | 30 | 7/01/1997 | DOM | | | 11.0 | -4.9 | 7/01/1997 | 24470 | 38800 | 7/02/1997 | | | 1 | 31/01/1997 |
| 6628-18259 | WW | Qpah | 15 | 6/02/1997 | DOM | | | 3.9 | 1.1 | 6/02/1997 | 1917 | 3450 | 6/02/1997 | | | 1 | 6/02/1997 |
| 6628-18260 | WW | Qpah | 12 | 18/02/1997 | DOM | | | 6.0 | 2.8 | 18/02/1997 | 2092 | 3760 | 18/02/1997 | | | 1 | 18/02/1997 |
| 6628-18282 | WW | Qpah | 12 | 30/01/1997 | DOM | | | 4.5 | 1.6 | 30/01/1997 | 12141 | 20500 | 30/01/1997 | | | 2 | 30/01/1997 |
| 6628-18405 | WW | Qpah | 18 | 2/01/1997 | DOM | | | | | | 8476 | 14600 | 2/01/1997 | | | | |
| 6628-18433 | WW | Qpah | 15 | 17/12/1996 | DOM | | | 6.0 | 3.7 | 17/12/1996 | 2347 | 4210 | 17/12/1996 | | | 1 | 17/12/1996 |
| 6628-18477 | WW | Qpah | 15 | 19/12/1996 | DOM | | | 5.4 | 1.6 | 19/12/1996 | 6960 | 12100 | 19/12/1996 | | | 1 | 19/12/1996 |

GOLDER

# WaterConnect Register Search

**Project Number:** 19131233
**Project:** Albert Park
**Site Address:** Albert Park
**Search Date:** 28/11/2019
**Prepared by:** JGC

**Acronyms**
EC: Electrical Conductivity (µS/cm)
TDS: Total Dissolved Solids (mg/L)
RWL: Relative standing water level
SWL: Standing water level

**Purpose**

| | | |
|---|---|---|
| APN: Anode Protection | FND: Foundations | REC: Recharge |
| APP: Appraisal | GEN: General Usage | RHL: Rock Hole |
| ASR: Aquifer Storage and Recovery | GTH: Geothermal Energy | RIV: River |
| CMT: Construction Materials | HOL: Water Hole | SCI: Scientific |
| COA: Coal | IND: Industrial | SEA: Sea Water |
| DAM: Dam | INV: Investigation | SEI: Seismic Status |
| DEP: Deepening | IRR: Irrigation | SOK: Soak |
| DEV: Development | LAK: Lake | SPR: Spring |
| DOM: Domestic | LWD: Liquid Waste Disposal | STK: Stock |
| DRN: Drainage | MON: Monitoring | TNK: Tank |
| DWT: Dewatering | MWS: Mine Water Supply | TWS: Town Water Supply |
| ENV: Environmental | OBS: Observation | UKN: Uknown |
| ETH: Earthing | PRO: Production | WAS: Waste Disposal |
| EXP: Exploration | RCL: Recreational | |
| FIR: Fire Fighting | RDC: Road Construction / Maintenance | |

**Status**

| | |
|---|---|
| ABD: Abandoned | NOP: Not Operational |
| BKF: Backfilled | UFL: Uncontrolled flowing |
| CFL: Controlled flowing | UKN: Unknown |
| NL: Not located | RHB: Rehabilitated |
| OPR: Operational | |

**Well Search Summary**

| | | |
|---|---|---|
| Search Radius: | | 2 km |
| Total number of wells: | | 735 |
| Number of onsite wells: | | 8 |
| Inferred shallow wells (<20 m): | | 632 |
| Salinity in wells (TDS in mg/L) | Min: | 121 |
| | Max: | 50540 |

| Unit_No | Drillhole | Aquifer | Max drill depth | Max drill date | Purpose | Latest status | Latest status date | SWL | RSWL | Water level date | TDS | EC | Salinity date | pH | pH date | Yield | Yield date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6628-18506 | WW | Qhck | 4.5 | 18/11/1996 | OBS | | | 2.5 | 2.2 | 18/11/1996 | 7491 | 13000 | 18/11/1996 | 7 | 18/11/1996 | | |
| 6628-18507 | WW | Qhck | 6 | 18/11/1996 | OBS | BKF | 6/06/2016 | 3.1 | 1.6 | 18/11/1996 | 2631 | 4710 | 28/11/1996 | 7 | 28/11/1996 | | |
| 6628-18508 | WW | Qhck | 6 | 18/11/1996 | OBS | BKF | 6/06/2016 | 2.9 | 1.8 | 18/11/1996 | 419 | 761 | 28/11/1996 | 7 | 28/11/1996 | | |
| 6628-18534 | WW | Qpah | 12 | 26/05/1997 | DOM | | | 6.0 | 3.8 | 26/05/1997 | 2165 | 3890 | 26/05/1997 | | | 2 | 26/05/1997 |
| 6628-18535 | WW | Qpah | 12 | 10/03/1997 | DOM | | | 6.0 | 3.9 | 10/03/1997 | 2323 | 4170 | 10/03/1997 | | | 2 | 10/03/1997 |
| 6628-18551 | WW | Qpah | 14 | 25/02/1997 | DOM | | | 4.0 | 1.7 | 25/02/1997 | 2693 | 4820 | 25/02/1997 | | | 2 | 25/02/1997 |
| 6628-18564 | WW | Qpah | 9 | 26/06/1996 | OBS | | | 3.6 | 1.2 | 26/06/1996 | | | | | | | |
| 6628-18623 | WW | Qpah | 13 | 10/07/1997 | | | | 3.8 | 1.7 | 10/07/1997 | 2784 | 4980 | 10/07/1997 | | | 2 | 10/07/1997 |
| 6628-18742 | WW | Qpah | 17 | 21/01/1998 | DOM | | | 7.0 | 0.6 | 21/01/1998 | 11407 | 19330 | 21/01/1998 | | | 0 | 21/01/1998 |
| 6628-18862 | WW | Qpah | 12 | 16/03/1998 | DOM | | | 5.0 | -0.5 | 16/03/1998 | 7144 | 12420 | 16/03/1998 | | | | |
| 6628-18904 | WW | Qpah | 24 | 21/02/1998 | DRN | | | 5.0 | -0.4 | 21/02/1998 | 18364 | 30000 | 21/03/1998 | | | 1 | 21/02/1998 |
| 6628-18954 | WW | Qpah | 23 | 23/04/1998 | DRN | | | 6.0 | 1.2 | 23/04/1998 | 2460 | 4410 | 23/04/1998 | | | 2 | 23/04/1998 |
| 6628-19011 | WW | Qpah | 11.5 | 26/05/1998 | DOM | | | 4.0 | 1.6 | 26/05/1998 | 6251 | 10930 | 26/05/1998 | | | 1 | 26/05/1998 |
| 6628-19080 | WW | Qhck | 6 | 21/05/1998 | MON | | | 3.2 | 1.5 | 21/05/1998 | | | | | | 0 | 21/05/1998 |
| 6628-19081 | WW | Qhck | 6 | 21/05/1998 | MON | | | 3.0 | 1.7 | 21/05/1998 | | | | | | 0 | 21/05/1998 |
| 6628-19082 | WW | Qhck | 6 | 21/05/1998 | MON | | | 2.9 | 1.8 | 21/05/1998 | | | | | | 0 | 21/05/1998 |
| 6628-19083 | WW | Qhck | 6 | 21/05/1998 | MON | | | 3.0 | 1.7 | 21/05/1998 | | | | | | 0 | 21/05/1998 |
| 6628-19135 | WW | Qpah | 10 | 4/07/1996 | OBS | | | 3.8 | 0.8 | 4/07/1996 | | | | | | | |
| 6628-19136 | WW | Qpah | 8 | 4/07/1996 | OBS | | | 3.8 | 0.7 | 4/07/1996 | | | | | | | |
| 6628-19137 | WW | Qpah | 9 | 4/07/1996 | OBS | | | 3.9 | 0.7 | 4/07/1996 | | | | | | | |
| 6628-19138 | WW | Qpah | 10 | 5/07/1996 | OBS | | | 3.8 | 0.8 | 5/07/1996 | | | | | | | |
| 6628-19139 | WW | Qpah | 9 | 5/07/1996 | OBS | | | 3.8 | 0.7 | 5/07/1996 | | | | | | | |
| 6628-19140 | WW | Qpah | 9 | 24/04/1996 | OBS | | | 3.9 | 0.7 | 24/04/1996 | | | | | | | |
| 6628-19171 | WW | Qpah | 18 | 19/09/1998 | DOM | | | 7.5 | 1.9 | 19/09/1998 | 1765 | 3180 | 19/09/1998 | | | | |
| 6628-19202 | WW | Qpah | 11.5 | 25/09/1998 | DOM | | | 5.0 | 1.9 | 25/09/1998 | 2864 | 5120 | 31/10/1998 | | | 1 | 25/09/1998 |
| 6628-19205 | WW | Qpah | 9 | 31/10/1998 | DRN | | | 4.0 | 2.9 | 31/10/1998 | | | | | | 1 | 31/10/1998 |
| 6628-19312 | WW | Qpah | 12 | 14/01/1999 | DOM | | | 4.0 | 0.9 | 14/01/1999 | 4465 | 7900 | 14/01/1999 | | | 1 | 14/01/1999 |
| 6628-19339 | WW | Qpah | 12 | 7/01/1999 | DOM | | | 4.0 | 2.7 | 7/01/1999 | 3731 | 6630 | 1/01/1999 | | | 1 | 7/01/1999 |
| 6628-19351 | WW | Qhck | 6 | 11/11/1998 | MON | | | 4.8 | -0.1 | 11/11/1998 | | | | | | 0 | 11/11/1998 |
| 6628-19352 | WW | Qhck | 6 | 11/11/1998 | MON | | | 4.8 | 0.0 | 11/11/1998 | | | | | | 0 | 11/11/1998 |
| 6628-19353 | WW | Qhck | 6 | 11/11/1998 | MON | | | 4.8 | 0.0 | 11/11/1998 | | | | | | 0 | 11/11/1998 |
| 6628-19363 | WW | Qpah(Q1) | 15 | 8/02/1999 | DOM | | | 5.0 | -0.1 | 8/02/1999 | 1770 | 3190 | 8/02/1999 | | | 1 | 8/02/1999 |
| 6628-19364 | WW | Qpah | 12 | 18/02/1999 | DOM | | | 4.5 | 1.0 | 18/02/1999 | 2171 | 3900 | 18/02/1999 | | | 1 | 18/02/1999 |
| 6628-19400 | WW | Qpah | 18 | 16/02/1999 | DOM | | | 6.6 | 2.2 | 16/02/1999 | 1055 | 1910 | 16/02/1999 | | | 1 | 16/02/1999 |
| 6628-19628 | WW | Qhck | 6 | 27/04/1999 | MON | | | 2.9 | 1.8 | 27/04/1999 | | | | | | 0 | 27/04/1999 |
| 6628-19629 | WW | Qhck | 6 | 27/04/1999 | MON | | | 2.9 | 1.9 | 27/04/1999 | | | | | | 0 | 27/04/1999 |
| 6628-19706 | WW | Qpah | 16.5 | 20/09/1999 | DOM | | | 6.6 | 1.5 | 20/09/1999 | 2693 | 4820 | 20/09/1999 | | | 1 | 20/09/1999 |
| 6628-19708 | WW | Qpah | 18 | 18/09/1999 | DOM | | | 7.5 | 2.2 | 18/09/1999 | 1883 | 3390 | 18/09/1999 | | | 1 | 18/09/1999 |
| 6628-19897 | WW | Qpah | 8 | 1/12/1999 | MON | | | 5.8 | 3.5 | 1/12/1999 | | | | | | | |
| 6628-19898 | WW | Qpah | 8 | 1/12/1999 | MON | | | 5.4 | 3.8 | 1/12/1999 | | | | | | | |
| 6628-19899 | WW | Qpah | 8 | 1/12/1999 | MON | | | 5.8 | 3.4 | 1/12/1999 | | | | | | | |
| 6628-19900 | WW | Qpah | 8 | 1/12/1999 | MON | | | 5.6 | 3.6 | 1/12/1999 | | | | | | | |
| 6628-19901 | WW | Qpah | 8 | 1/12/1999 | MON | | | 5.4 | 3.8 | 1/12/1999 | | | | | | | |
| 6628-19902 | WW | Qpah | 8 | 1/12/1999 | MON | | | 5.6 | 3.5 | 1/12/1999 | | | | | | | |
| 6628-19903 | WW | Qpah | 8 | 1/12/1999 | MON | | | 5.7 | 3.5 | 1/12/1999 | | | | | | | |
| 6628-19904 | WW | Qpah | 8 | 1/12/1999 | MON | BKF | 14/06/2018 | 5.7 | 3.5 | 1/12/1999 | | | | | | | |
| 6628-19905 | WW | Qpah | 8 | 1/12/1999 | MON | BKF | 19/06/2018 | 5.2 | 4.0 | 1/12/1999 | | | | | | | |
| 6628-19906 | WW | Qpah | 15 | 1/12/1999 | MON | | | 5.4 | 3.8 | 1/12/1999 | | | | | | | |
| 6628-19907 | WW | Qpah | 15 | 1/12/1999 | MON | | | 5.6 | 3.6 | 1/12/1999 | | | | | | | |
| 6628-19908 | WW | Qpah | 15 | 1/12/1999 | MON | | | 5.9 | 3.4 | 1/12/1999 | | | | | | | |
| 6628-19972 | WW | Qpah | 15 | 8/12/1999 | DOM | | | 7.3 | 2.9 | 8/12/1999 | 1878 | 3380 | 8/12/1999 | | | 1 | 8/12/1999 |
| 6628-20019 | WW | Qpah | 10 | 10/12/1999 | DOM | ABD | 10/12/1999 | 3.0 | 1.8 | 10/12/1999 | 13886 | 23200 | 10/12/1999 | | | | |
| 6628-20071 | WW | Qpah | 5 | 10/11/1998 | MON | | | | | | | | | | | | |
| 6628-20072 | WW | Qpah | 5 | 10/11/1998 | MON | | | | | | | | | | | | |
| 6628-20073 | WW | Qpah | 5 | 11/11/1998 | MON | | | | | | | | | | | | |
| 6628-20074 | WW | Qpah | 5 | 16/12/1998 | MON | | | | | | | | | | | | |
| 6628-20075 | WW | Qpah | 5 | 16/12/1998 | MON | | | | | | | | | | | | |
| 6628-20099 | WW | Qpah | 15 | 25/01/2000 | IRR | | | 3.0 | 3.1 | 25/01/2000 | 3259 | 5810 | 18/04/2008 | | | 4 | 25/01/2000 |
| 6628-20100 | WW | Tomw(T1) | 121 | 2/03/2000 | IND | | | 20.6 | -16.1 | 2/03/2000 | 1090 | 1890 | 22/02/2005 | 8 | 22/02/2005 | 2 | 2/03/2000 |
| 6628-20151 | WW | Qpah | 25 | 2/02/2000 | MON | | | | | | | | | | | | |
| 6628-20152 | WW | Qpah | 15 | 2/02/2000 | MON | | | | | | | | | | | | |
| 6628-20153 | WW | Qpah | 15 | 2/02/2000 | MON | | | | | | | | | | | | |
| 6628-20154 | WW | Qpah | 15 | 1/02/2000 | MON | BKF | 14/06/2018 | | | | | | | | | | |
| 6628-20155 | WW | Qpah | 25 | 3/02/2000 | MON | | | | | | | | | | | | |
| 6628-20156 | WW | Qpah | 15 | 19/01/2000 | MON | BKF | 16/05/2018 | 5.2 | 3.9 | 19/01/2000 | | | | | | | |
| 6628-20189 | WW | Qpah | 27.5 | 14/04/2000 | DOM | | | 4.0 | 1.1 | 14/04/2000 | 1776 | 3200 | 14/04/2000 | | | 2 | 14/04/2000 |
| 6628-20235 | WW | Qpah | 15 | 23/05/2000 | DRN | | | 5.7 | 1.9 | 23/05/2000 | 1423 | 2570 | 23/05/2000 | | | | |
| 6628-20311 | WW | Qpah | 40 | 11/08/2000 | INV | | | | | | | | | | | | |
| 6628-20312 | WW | Qpah | 40 | 11/08/2000 | INV | | | | | | | | | | | | |
| 6628-20313 | WW | Qpah | 57 | 11/08/2000 | INV | | | | | | | | | | | | |
| 6628-20314 | WW | Qpah | 40 | 11/08/2000 | INV | | | | | | | | | | | | |
| 6628-20315 | WW | Qpah | 40 | 11/08/2000 | INV | | | | | | | | | | | | |
| 6628-20316 | WW | Qpah | 40 | 11/08/2000 | INV | BKF | 16/05/2018 | | | | | | | | | | |
| 6628-20320 | WW | Qpah | 40 | 18/04/2000 | INV | | | | | | | | | | | | |
| 6628-20321 | WW | Qpah | 57 | 19/04/2000 | INV | | | | | | | | | | | | |
| 6628-20343 | WW | Qpah | 24 | 24/09/2003 | DEPDRN | | | 4.3 | 4.8 | 24/09/2003 | 1647 | 2970 | 24/09/2003 | | | 3 | 24/09/2003 |
| 6628-20402 | WW | Qpah | 11 | 2/11/2000 | DRN | | | 7.0 | 2.2 | 2/11/2000 | | | | | | 0 | 2/11/2000 |
| 6628-20445 | WW | Qpah | 5.5 | 12/12/2000 | DOM | | | 2.0 | 2.3 | 12/12/2000 | 1748 | 3150 | 12/12/2000 | | | 1 | 12/12/2000 |
| 6628-20448 | WW | Qpah | 6 | 1/12/2000 | DRN | | | 4.0 | 2.5 | 1/12/2000 | 722 | 1310 | 1/12/2000 | | | | |
| 6628-20449 | WW | Qpah | 6 | 1/12/2000 | DRN | | | 4.0 | 2.5 | 1/12/2000 | 907 | 1644 | 5/05/2005 | | | | |
| 6628-20623 | WW | Qpah | 12 | 19/06/2001 | DOM | | | 6.0 | 2.6 | 19/06/2001 | 1468 | 2650 | 19/06/2001 | | | | |
| 6628-20857 | WW | Qhck | 6 | 15/04/2002 | OBS | | | 3.2 | 1.4 | 15/04/2002 | | | | | | 0 | 15/04/2002 |
| 6628-21032 | WW | Qpah | 32 | 7/12/2000 | DOM | | | 12.0 | -5.9 | 7/12/2000 | 882 | 1600 | 7/12/2001 | | | 1 | 7/12/2000 |
| 6628-21109 | WW | Qpah | 10 | 13/11/2002 | DOM | ABD | 13/11/2002 | | | | 5081 | 8950 | 13/11/2002 | | | | |
| 6628-21112 | WW | Qpah | 14 | 7/11/2002 | DRN | | | 14.0 | -4.5 | 7/11/2002 | 2585 | 4630 | 7/11/2002 | | | | |
| 6628-21134 | WW | Qpah | 13 | 3/06/2002 | DOM | | | 4.5 | 0.4 | 3/06/2002 | 4479 | 7920 | 3/06/2002 | | | 1 | 3/06/2002 |
| 6628-21137 | WW | Qpah | 12 | 4/03/2002 | DOM | | | 4.1 | 0.9 | 4/03/2002 | 9778 | 16720 | 4/03/2002 | | | 1 | 4/03/2002 |
| 6628-21286 | WW | Qpah | 10 | 5/06/2003 | DRN | | | 4.6 | 3.6 | 5/06/2003 | 3202 | 5710 | 5/06/2003 | | | 1 | 5/06/2003 |
| 6628-21472 | WW | Qpah | 10.5 | 13/05/2003 | DOM | | | 3.7 | 2.2 | 13/05/2003 | 21191 | 34100 | 13/05/2003 | | | 2 | 13/05/2003 |
| 6628-21504 | WW | Qpah | 18 | 15/07/2003 | DOM | | | 8.1 | -0.8 | 15/07/2003 | 2585 | 4630 | 15/07/2003 | | | 2 | 15/07/2003 |
| 6628-21535 | WW | Qpah | 45 | 12/04/2003 | | | | 5.9 | 3.3 | 12/04/2003 | | | | | | | |
| 6628-21538 | WW | Qpah | 7 | 21/10/2003 | DOM | | | 2.0 | 2.4 | 21/10/2003 | 11092 | 18830 | 21/10/2003 | | | 1 | 21/10/2003 |
| 6628-21685 | WW | Qpah | 40 | 28/05/2004 | MON | | | 9.0 | -0.3 | 28/05/2004 | | | | | | | |
| 6628-21710 | WW | Qpah | 35 | 18/03/2004 | MON | | | 8.0 | -1.1 | 18/03/2004 | 42980 | 61400 | 18/03/2004 | | | 1 | 18/03/2004 |
| 6628-21711 | WW | Qpah | 19 | 19/03/2004 | INV | | | 5.5 | 2.4 | 19/03/2004 | 7312 | 12690 | 19/03/2004 | | | 1 | 19/03/2004 |
| 6628-21712 | WW | Qpah | 19 | 30/03/2004 | INV | | | 4.0 | 4.1 | 30/03/2004 | 2493 | 4470 | 30/03/2004 | | | 1 | 30/03/2004 |
| 6628-21713 | WW | Qpah | 19 | 23/03/2004 | INV | BKF | 23/03/2004 | | | | | | | | | | |
| 6628-21714 | WW | Qpah | 35 | 24/03/2004 | MON | | | 5.5 | 1.7 | 24/03/2004 | 34719 | 52700 | 24/03/2004 | | | 1 | 24/03/2004 |
| 6628-21715 | WW | Qpah | 19 | 25/03/2004 | INV | | | 4.0 | 3.3 | 25/03/2004 | 7994 | 13820 | 25/03/2004 | | | 1 | 25/03/2004 |
| 6628-21716 | WW | Qpah | 19 | 29/03/2004 | MON | | | 5.0 | 1.9 | 29/03/2004 | 1815 | 3270 | 29/03/2004 | | | 1 | 29/03/2004 |
| 6628-21717 | WW | Qpah | 6.5 | 4/03/2004 | MON | | | | | | | | | | | | |

GOLDER

# WaterConnect Register Search

**Project Number:** 19131233
**Project:** Albert Park
**Site Address:** Albert Park
**Search Date:** 28/11/2019
**Prepared by:** JGC

**Acronyms**
EC: Electrical Conductivity (µS/cm)
TDS: Total Dissolved Solids (mg/L)
RWL: Relative standing water level
SWL: Standing water level

**Purpose**

| | | |
|---|---|---|
| APN: Anode Protection | FND: Foundations | REC: Recharge |
| APP: Appraisal | GEN: General Usage | RHL: Rock Hole |
| ASR: Aquifer Storage and Recovery | GTH: Geothermal Energy | RIV: River |
| CMT: Construction Materials | HOL: Water Hole | SCI: Scientific |
| COA: Coal | IND: Industrial | SEA: Sea Water |
| DAM: Dam | INV: Investigation | SEI: Seismic Status |
| DEP: Deepening | IRR: Irrigation | SOK: Soak |
| DEV: Development | LAK: Lake | SPR: Spring |
| DOM: Domestic | LWD: Liquid Waste Disposal | STK: Stock |
| DRN: Drainage | MON: Monitoring | TNK: Tank |
| DWT: Dewatering | MWS: Mine Water Supply | TWS: Town Water Supply |
| ENV: Environmental | OBS: Observation | UKN: Uknown |
| ETH: Earthing | PRO: Production | WAS: Waste Disposal |
| EXP: Exploration | RCL: Recreational | |
| FIR: Fire Fighting | RDC: Road Construction / Maintenance | |

**Status**

| | |
|---|---|
| ABD: Abandoned | NOP: Not Operational |
| BKF: Backfilled | UFL: Uncontrolled flowing |
| CFL: Controlled flowing | UKN: Unknown |
| NL: Not located | RHB: Rehabilitated |
| OPR: Operational | |

**Well Search Summary**

| | | |
|---|---|---|
| Search Radius: | | 2 km |
| Total number of wells: | | 735 |
| Number of onsite wells: | | 8 |
| Inferred shallow wells (<20 m): | | 632 |
| Salinity in wells (TDS in mg/L) | Min: | 121 |
| | Max: | 50540 |

| Unit_No | Drillhole | Aquifer | Max drill depth | Max drill date | Purpose | Latest status | Latest status date | SWL | RSWL | Water level date | TDS | EC | Salinity date | pH | pH date | Yield | Yield date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6628-21718 | WW | Qpah | 19 | 8/03/2004 | MON | | | 4.5 | 2.5 | 8/03/2004 | 8280 | 14290 | 1/04/2004 | | | 0 | 8/03/2004 |
| 6628-21719 | WW | Qpah | 6.5 | 4/03/2004 | MON | | | | | | | | | | | | |
| 6628-21722 | WW | Qpah | 7.5 | 5/03/2004 | MON | | | | | | | | | | | | |
| 6628-21764 | WW | Qhck | 6 | 22/05/2004 | DOM | | | 2.5 | 2.1 | 22/05/2004 | 2386 | 4280 | 22/05/2004 | | | 1 | 22/05/2004 |
| 6628-21834 | WW | Qpah | 35 | 21/07/2004 | MON | | | 6.0 | 0.8 | 21/07/2004 | 43120 | 61600 | 10/08/2004 | | | 1 | 10/08/2004 |
| 6628-21861 | WW | Qpah | 9 | 5/08/2000 | DRN | | | 3.3 | 1.7 | 5/08/2000 | 4268 | 7560 | 5/08/2000 | | | | |
| 6628-21865 | WW | Qpah | 21 | 17/08/2004 | MON | | | 16.0 | -8.5 | 17/08/2004 | | | | | | 0 | 17/08/2004 |
| 6628-22439 | WW | Qpah | 5.7 | 15/03/2006 | INV | | | | | | | | | | | | |
| 6628-22440 | WW | Qpah | 5.6 | 15/03/2006 | INV | | | 3.2 | 1.6 | 15/03/2006 | | | | | | | |
| 6628-22441 | WW | Qpah | 5.7 | 15/03/2006 | INV | | | | | | | | | | | | |
| 6628-22451 | WW | Qpah | 12 | 6/01/2006 | MON | | | 6.0 | 1.2 | 6/01/2006 | | | | | | | |
| 6628-22452 | WW | Qpah | 19.5 | 5/01/2006 | MON | | | 6.0 | 1.3 | 5/01/2006 | | | | | | | |
| 6628-22453 | WW | Qpah | 22 | 6/01/2006 | MON | | | 6.0 | 1.5 | 6/01/2006 | | | | | | | |
| 6628-22454 | WW | Qpah | 20 | 7/01/2006 | MON | | | 6.0 | 1.4 | 7/01/2006 | | | | | | | |
| 6628-22455 | WW | Qpah | 15.5 | 7/01/2006 | MON | | | 6.0 | 2.3 | 7/01/2006 | | | | | | | |
| 6628-22456 | WW | Qpah | 16.5 | 8/01/2006 | MON | | | 6.0 | 1.1 | 8/01/2006 | | | | | | | |
| 6628-22463 | WW | Qpah | 11.5 | 18/01/2006 | MON | | | 9.4 | -2.6 | 18/01/2006 | | | | | | 0 | 18/01/2006 |
| 6628-22464 | WW | Qpah | 11.5 | 17/01/2006 | MON | | | 9.6 | -2.4 | 17/01/2006 | | | | | | 0 | 17/01/2006 |
| 6628-22465 | WW | Qpah | 11.5 | 17/01/2006 | MON | | | 9.6 | -2.5 | 17/01/2006 | | | | | | 0 | 17/01/2006 |
| 6628-22466 | WW | Qpah | 11.7 | 16/01/2006 | MON | | | 9.3 | -2.2 | 16/01/2006 | | | | | | 0 | 16/01/2006 |
| 6628-22467 | WW | Qpah | 11.5 | 16/01/2006 | MON | | | 9.0 | -2.1 | 16/01/2006 | | | | | | 0 | 16/01/2006 |
| 6628-22468 | WW | Qpah | 11.5 | 16/01/2006 | MON | | | 9.0 | -2.1 | 16/01/2006 | | | | | | 0 | 16/01/2006 |
| 6628-22572 | WW | Qpah | 10.2 | 6/04/2005 | DRN | | | 5.4 | 3.8 | 6/04/2005 | 1222 | 2210 | 6/04/2005 | | | 1 | 6/04/2005 |
| 6628-22596 | WW | Tomw(T1) | 196.1 | 28/07/2006 | MON | | | 9.1 | -4.3 | 28/07/2006 | 868 | 1575 | 28/07/2006 | | | 10 | 28/07/2006 |
| 6628-22699 | WW | Tomw(T1) | 192.4 | 11/08/2006 | IRRMAR | OPR | 7/03/2016 | 8.7 | -3.9 | 11/08/2006 | | | | | | 10 | 11/08/2006 |
| 6628-22935 | WW | Qpah | 9 | 12/11/2006 | INV | | | 6.0 | 2.1 | 12/11/2006 | | | | | | | |
| 6628-22936 | WW | Qpah | 9 | 12/11/2006 | INV | | | 5.0 | 3.1 | 12/11/2006 | | | | | | | |
| 6628-22937 | WW | Qpah | 9 | 12/11/2006 | INV | | | 5.0 | 3.1 | 12/11/2006 | | | | | | | |
| 6628-22938 | WW | Qpah | 9 | 14/11/2006 | INV | | | 5.0 | 3.2 | 14/11/2006 | | | | | | | |
| 6628-22939 | WW | Qpah | 9 | 15/11/2006 | INV | | | 5.0 | 3.2 | 15/11/2006 | | | | | | | |
| 6628-22940 | WW | Qpah | 9 | 16/11/2006 | INV | | | 5.0 | 3.2 | 16/11/2006 | | | | | | | |
| 6628-22941 | WW | Qpah | 30 | 14/11/2006 | INV | | | 6.0 | 2.2 | 14/11/2006 | | | | | | | |
| 6628-22942 | WW | Qpah | 20 | 11/11/2006 | INV | | | 6.0 | 2.2 | 11/11/2006 | | | | | | | |
| 6628-22943 | WW | Qpah | 20 | 12/11/2006 | INV | | | 6.0 | 2.3 | 12/11/2006 | | | | | | | |
| 6628-22944 | WW | Qpah | 20 | 13/11/2006 | INV | | | 6.0 | 2.3 | 13/11/2006 | | | | | | | |
| 6628-22945 | WW | Qpah | 20 | 14/11/2006 | INV | | | 6.0 | 2.0 | 14/11/2006 | | | | | | | |
| 6628-22946 | WW | Qpah | 20 | 15/11/2006 | INV | | | 6.0 | 2.0 | 15/11/2006 | | | | | | | |
| 6628-22947 | WW | Qpah | 20 | 16/11/2006 | INV | | | 6.0 | 2.0 | 16/11/2006 | | | | | | | |
| 6628-22948 | WW | Qpah | 9 | 16/11/2006 | INV | | | 5.0 | 3.0 | 16/11/2006 | | | | | | | |
| 6628-23071 | WW | Qpah | 8.5 | 3/09/2007 | | | | 6.0 | 2.5 | 3/09/2007 | | | | | | | |
| 6628-23191 | WW | Qpah | 12 | 24/01/2007 | | | | 5.8 | 3.1 | 24/01/2007 | 785 | 1423 | 24/03/2007 | | | 2 | 24/01/2007 |
| 6628-23345 | WW | Qpah | 10 | 25/07/2007 | | | | 3.9 | 0.9 | 25/07/2007 | 2493 | 4470 | 30/07/2007 | | | 2 | 25/07/2007 |
| 6628-23490 | WW | Qpah | 14 | 5/07/2007 | INV | | | 10.0 | -1.6 | 5/07/2007 | | | | | | | |
| 6628-23496 | WW | Qhck | 9.5 | 10/07/2007 | INV | | | 1.0 | 3.6 | 10/07/2007 | | | | | | | |
| 6628-23584 | WW | Qpah | 10 | 10/01/2008 | | | | 5.5 | 1.3 | 10/01/2008 | 3690 | 6560 | 10/01/2008 | | | 1 | 10/01/2008 |
| 6628-23633 | WW | Qpah | 22.2 | 26/03/2007 | | | | 4.5 | 0.3 | 26/03/2007 | 3126 | 5580 | 26/03/2007 | | | 1 | 26/03/2007 |
| 6628-24551 | WW | Qpah | 10 | 11/02/2008 | | | | 4.9 | 0.0 | 11/02/2008 | 4343 | 7690 | 11/02/2008 | | | 1 | 11/02/2008 |
| 6628-24570 | WW | Qpah | | 9/04/2009 | | | | | | | | | | | | | |
| 6628-24741 | WW | Qpah | 11.5 | 10/11/2008 | | | | 7.0 | -1.6 | 10/11/2008 | 3235 | 5770 | 10/11/2008 | | | 1 | 10/11/2008 |
| 6628-24756 | WW | Qpah | 7.5 | 19/01/2008 | INV | | | 3.0 | | 19/01/2008 | | | | | | | |
| 6628-24757 | WW | Qpah | 17 | 27/01/2009 | INV | | | | | | | | | | | | |
| 6628-24758 | WW | Qpah | 18 | 26/01/2009 | INV | | | | | | | | | | | | |
| 6628-24759 | WW | Qpah | 8.5 | 19/01/2009 | INV | | | 3.0 | | 19/01/2009 | | | | | | | |
| 6628-24917 | WW | Qhck | 4 | 4/09/2009 | | | | 3.0 | | 4/09/2009 | | | | | | | |
| 6628-24918 | WW, ENG | Qpah | 3.5 | 4/09/2009 | | | | 3.0 | | 4/09/2009 | | | | | | | |
| 6628-24919 | WW, ENG | Qhck | 4 | 4/09/2009 | | | | 3.0 | | 4/09/2009 | | | | | | | |
| 6628-25072 | WW | Qpah | | 2/03/2010 | | BKF | 29/01/2010 | | | | | | | | | | |
| 6628-25073 | WW | Qpah | | 2/03/2010 | | BKF | 29/01/2010 | | | | | | | | | | |
| 6628-25074 | WW | Qpah | | 29/01/2010 | | | | | | | | | | | | | |
| 6628-25118 | WW | Qpah | 5 | 29/01/2010 | INV | | | 3.6 | | 29/01/2010 | | | | | | | |
| 6628-25119 | WW | Qpah | 5 | 28/01/2010 | INV | | | 3.7 | | 28/01/2010 | | | | | | | |
| 6628-25120 | WW | Qpah | 5 | 28/01/2010 | INV | | | 3.5 | | 28/01/2010 | | | | | | | |
| 6628-25121 | WW | Qpah | 5 | 27/01/2010 | INV | | | 3.8 | | 27/01/2010 | | | | | | | |
| 6628-25122 | WW | Qpah | 5 | 28/01/2010 | INV | | | 3.7 | | 28/01/2010 | | | | | | | |
| 6628-25123 | WW | Qpah | 5 | 29/01/2010 | INV | | | 3.4 | | 29/01/2010 | | | | | | | |
| 6628-25124 | WW | Qpah | 5 | 28/01/2010 | INV | | | 4.5 | | 28/01/2010 | | | | | | | |
| 6628-25125 | WW | Qpah | 5 | 29/01/2010 | INV | | | 3.6 | | 29/01/2010 | | | | | | | |
| 6628-25126 | WW | Qpah | 5.2 | 29/01/2010 | INV | | | 3.8 | | 29/01/2010 | | | | | | | |
| 6628-25127 | WW | Qpah | 5 | 27/01/2010 | INV | | | 3.9 | | 27/01/2010 | | | | | | | |
| 6628-25128 | WW | Qpah | 5 | 29/01/2010 | INV | | | 3.6 | | 29/01/2010 | | | | | | | |
| 6628-25150 | WW | Qhck | 12 | 6/07/2007 | INV | | | 2.0 | | 6/07/2007 | | | | | | | |
| 6628-25151 | WW | Qhck | 9 | 9/07/2007 | INV | | | 1.0 | | 9/07/2007 | | | | | | | |
| 6628-25152 | WW | Qhck | 14 | 10/07/2007 | INV | | | 1.0 | | 10/07/2007 | | | | | | | |
| 6628-25429 | WW | Qpah | 8 | 13/10/2010 | INV | | | 6.0 | | 13/10/2010 | | | | | | | |
| 6628-25435 | WW | Qpah | 19 | 22/10/2010 | INV | | | | | | | | | | | | |
| 6628-25491 | WW | Qpah | 17 | 25/10/2010 | INV | | | 8.0 | | 25/10/2010 | | | | | | | |
| 6628-25567 | WW | Qpah | 22 | 17/12/2009 | | | | 4.0 | | 17/12/2009 | 1979 | 3560 | 17/12/2009 | | | 2 | 17/12/2009 |
| 6628-25716 | WW | Qpah | 8 | 13/10/2010 | INV | | | 6.0 | | 13/10/2010 | 2205 | 3960 | 13/10/2010 | | | | |
| 6628-26207 | WW | Qpah | 7.5 | 16/02/2012 | INV | | | | | | | | | | | | |
| 6628-26292 | WW | Qpah | 7.5 | 21/03/2012 | INV | | | 3.9 | | 21/03/2012 | 9591 | 16430 | 21/03/2012 | | | | |
| 6628-26293 | WW | Qpah | 6 | 21/03/2012 | INV | | | 4.0 | | 21/03/2012 | 1474 | 2660 | 23/03/2012 | | | | |
| 6628-26294 | WW | Qpah | 7.5 | 21/03/2012 | INV | | | 4.0 | | 21/03/2012 | 4199 | 7440 | 21/03/2012 | | | | |
| 6628-26303 | WW | Tomw(T2) | 265 | 19/11/2011 | MAR | OPR | 1/09/2016 | 13.0 | | 19/11/2011 | | | | | | 30 | 19/11/2011 |
| 6628-26304 | WW | Tomw(T2) | 247 | 3/11/2011 | MAR | OPR | 1/09/2016 | 14.0 | | 3/11/2011 | | | | | | 25 | 3/11/2011 |
| 6628-26305 | WW | Tomw(T2) | 258 | 30/03/2012 | MAR | OPR | 1/09/2016 | 7.0 | | 30/03/2012 | 2329 | 4180 | 30/03/2012 | | | 40 | 30/03/2012 |
| 6628-26336 | WW | Qpah | 8 | 9/01/2012 | INV | | | | | | | | | | | | |
| 6628-26337 | WW | Qpah | 9.8 | 9/01/2012 | INV | | | | | | | | | | | | |
| 6628-26338 | WW | Qpah | 9 | 10/01/2012 | INV | | | | | | | | | | | | |
| 6628-26339 | WW | Qpah | 7 | 10/01/2011 | INV | | | | | | | | | | | | |
| 6628-26340 | WW | Qpah | 6 | 10/01/2012 | INV | | | | | | | | | | | | |
| 6628-26341 | WW | Qpah | 6.5 | 11/01/2012 | INV | | | 4.8 | | 11/01/2012 | | | | | | | |
| 6628-26342 | WW | Qpah | 6 | 11/01/2012 | INV | | | | | | | | | | | | |
| 6628-26343 | WW | Qpah | 21 | 13/01/2012 | INV | | | | | | | | | | | | |
| 6628-26344 | WW | Qpah | 16 | 13/01/2012 | INV | | | | | | | | | | | | |
| 6628-26345 | WW | Qpah | 16 | 13/01/2012 | INV | | | | | | | | | | | | |
| 6628-26346 | WW | Qpah | 16.5 | 16/01/2011 | INV | | | | | | | | | | | | |
| 6628-26347 | WW | Qpah | 16 | 16/01/2012 | INV | | | | | | | | | | | | |
| 6628-26348 | WW | Qpah | 16 | 17/01/2012 | INV | | | | | | | | | | | | |
| 6628-26349 | WW | Qpah | 15.5 | 17/01/2012 | INV | | | | | | | | | | | | |
| 6628-26366 | WW | Qpah | 5 | 7/02/2012 | INV | BKF | 8/02/2012 | | | | | | | | | | |
| 6628-26367 | WW | Qpah | 4.5 | 7/02/2012 | INV | | | | | | | | | | | | |

GOLDER

# WaterConnect Register Search

**Project Number:** 19131233
**Project:** Albert Park
**Site Address:** Albert Park
**Search Date:** 28/11/2019
**Prepared by:** JGC

**Acronyms**
EC: Electrical Conductivity (µS/cm)
TDS: Total Dissolved Solids (mg/L)
RWL: Relative standing water level
SWL: Standing water level

**Purpose**

| | | |
|---|---|---|
| APN: Anode Protection | FND: Foundations | REC: Recharge |
| APP: Appraisal | GEN: General Usage | RHL: Rock Hole |
| ASR: Aquifer Storage and Recovery | GTH: Geothermal Energy | RIV: River |
| CMT: Construction Materials | HOL: Water Hole | SCI: Scientific |
| COA: Coal | IND: Industrial | SEA: Sea Water |
| DAM: Dam | INV: Investigation | SEI: Seismic Status |
| DEP: Deepening | IRR: Irrigation | SOK: Soak |
| DEV: Development | LAK: Lake | SPR: Spring |
| DOM: Domestic | LWD: Liquid Waste Disposal | STK: Stock |
| DRN: Drainage | MON: Monitoring | TNK: Tank |
| DWT: Dewatering | MWS: Mine Water Supply | TWS: Town Water Supply |
| ENV: Environmental | OBS: Observation | UKN: Uknown |
| ETH: Earthing | PRO: Production | WAS: Waste Disposal |
| EXP: Exploration | RCL: Recreational | |
| FIR: Fire Fighting | RDC: Road Construction / Maintenance | |

**Status**

| | |
|---|---|
| ABD: Abandoned | NOP: Not Operational |
| BKF: Backfilled | UFL: Uncontrolled flowing |
| CFL: Controlled flowing | UKN: Unknown |
| NL: Not located | RHB: Rehabilitated |
| OPR: Operational | |

**Well Search Summary**

| | | |
|---|---|---|
| Search Radius: | | 2 km |
| Total number of wells: | | 735 |
| Number of onsite wells: | | 8 |
| Inferred shallow wells (<20 m): | | 632 |
| Salinity in wells (TDS in mg/L) | Min: | 121 |
| | Max: | 50540 |

| Unit_No | Drillhole | Aquifer | Max drill depth | Max drill date | Purpose | Latest status | Latest status date | SWL | RSWL | Water level date | TDS | EC | Salinity date | pH | pH date | Yield | Yield date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6628-26368 | WW | Qpah | 5 | 7/02/2012 | INV | BKF | 8/02/2012 | | | | | | | | | | |
| 6628-26369 | WW | Qpah | 4.5 | 7/02/2012 | INV | BKF | 8/02/2012 | | | | | | | | | | |
| 6628-26370 | WW | Qpah | 5 | 6/02/2012 | INV | | | | | | | | | | | | |
| 6628-26371 | WW | Qpah | 5 | 6/02/2012 | INV | | | | | | | | | | | | |
| 6628-26462 | WW | Qpah | 5.5 | 3/09/2012 | INV | | | 3.6 | | 3/09/2012 | | | | | | | |
| 6628-26463 | WW | Qpah | 5.5 | 3/09/2012 | INV | | | 3.5 | | 3/09/2012 | | | | | | | |
| 6628-26464 | WW | Qpah | 5.5 | 4/09/2012 | INV | | | 3.6 | | 4/09/2012 | | | | | | | |
| 6628-26465 | WW | Qpah | 5.5 | 4/09/2012 | | | | | | | | | | | | | |
| 6628-26466 | WW | Qpah | 5.5 | 4/09/2012 | INV | | | 3.6 | | 4/09/2012 | | | | | | | |
| 6628-26467 | WW | Qpah | 5 | 5/09/2012 | INV | | | 3.8 | | 5/09/2012 | | | | | | | |
| 6628-26468 | WW | Qpah | 4 | 5/09/2012 | INV | | | 3.6 | | 5/09/2012 | | | | | | | |
| 6628-26469 | WW | Qpah | 5 | 7/09/2012 | INV | | | 3.6 | | 7/09/2012 | | | | | | | |
| 6628-26470 | WW | Qpah | 4.5 | 7/09/2012 | INV | | | 3.7 | | 7/09/2012 | | | | | | | |
| 6628-26471 | WW | Qpah | 5 | 7/09/2012 | INV | | | 3.8 | | 7/09/2012 | | | | | | | |
| 6628-26479 | WW | Qpah | 5.2 | 9/10/2012 | | BKF | 9/10/2012 | 3.8 | | 9/10/2012 | | | | | | | |
| 6628-26480 | WW | Qpah | 3 | 9/10/2012 | | BKF | 9/10/2012 | | | | | | | | | | |
| 6628-26582 | WW | Qpah | 6 | 5/08/2012 | MON | | | 4.5 | | 5/08/2012 | | | | | | | |
| 6628-26583 | WW | Qpah | 6 | 5/08/2012 | MON | | | 3.8 | | 5/08/2012 | | | | | | | |
| 6628-26584 | WW | Qpah | 6.2 | 5/08/2012 | MON | | | 3.7 | | 5/08/2012 | | | | | | | |
| 6628-26604 | WW | Tomw(T2) | 259 | 30/11/2012 | MAR | OPR | 1/09/2016 | | | | 2624 | 4700 | 30/11/2012 | | | 30 | 30/11/2012 |
| 6628-26605 | WW | Tomw(T1) | 192 | 18/12/2012 | | | | 17.0 | | 18/12/2012 | 2108 | 3790 | 19/12/2012 | | | 30 | 18/12/2012 |
| 6628-26606 | WW | Tomw(T2) | 253 | 20/09/2012 | MAR | OPR | 1/09/2016 | 12.5 | | 20/09/2012 | 2955 | 5280 | 19/09/2012 | | | 30 | 20/09/2012 |
| 6628-26607 | WW | Tomw(T2) | 259 | 6/09/2012 | MAR | OPR | 1/09/2016 | 12.0 | | 6/09/2012 | 3230 | 5760 | 6/09/2012 | | | 30 | 6/09/2012 |
| 6628-26608 | WW | Tomw(T2) | 259 | 24/08/2012 | MAR | OPR | 1/09/2016 | 12.5 | | 24/08/2012 | 3287 | 5860 | 24/08/2012 | | | 30 | 24/08/2012 |
| 6628-26624 | WW | Tomw(T2) | 258 | 22/01/2013 | MAR | OPR | 1/09/2016 | 14.0 | | 22/01/2013 | 2761 | 4940 | 22/01/2013 | | | 30 | 22/01/2013 |
| 6628-26625 | WW | Tomw(T2) | 258 | 4/02/2013 | MAR | OPR | 1/09/2016 | 12.0 | | 4/02/2013 | 2138 | 3840 | 4/02/2013 | | | 30 | 4/02/2013 |
| 6628-26697 | WW | Qpah | 9 | 6/12/2012 | | BKF | 25/03/2014 | 3.5 | | 6/12/2012 | | | | | | | |
| 6628-26700 | WW | Qpah | 5.6 | 24/04/2013 | MON | | | 3.5 | | 24/04/2013 | | | | | | | |
| 6628-26740 | WW | Qpah | 5.6 | 24/04/2013 | | BKF | 28/06/2018 | | | 28/06/2018 | | | | | | | |
| 6628-26741 | WW | Qpah | 5.6 | 24/04/2013 | | BKF | 28/06/2018 | | | 28/06/2018 | | | | | | | |
| 6628-26843 | WW | Tomw(T2) | 258 | 21/06/2013 | MAR | OPR | 1/09/2016 | 7.0 | | 21/06/2013 | 2596 | 4650 | 19/02/2013 | | | 30 | 21/06/2013 |
| 6628-26844 | WW | Tomw(T2) | 258 | 1/03/2013 | MAR | OPR | 1/09/2016 | 7.5 | | 1/03/2013 | 2688 | 4810 | 5/03/2013 | | | 30 | 1/03/2013 |
| 6628-26845 | WW | Tomw(T2) | | 21/06/2013 | MAR | OPR | 1/09/2016 | 9.6 | | 21/06/2013 | 2636 | 4720 | 23/03/2013 | | | 30 | 21/06/2013 |
| 6628-26846 | WW | Tomw(T2) | | 21/06/2013 | MAR | OPR | 7/03/2016 | | | | 2732 | 4890 | 12/04/2013 | | | | |
| 6628-26847 | WW | Tomw(T1) | 184 | 21/06/2013 | IRR | OPQ | 5/05/2015 | 11.8 | | 21/06/2013 | 2364 | 4240 | 1/07/2013 | | | 30 | 1/07/2013 |
| 6628-26869 | WW | Qpah | 9.2 | 26/06/2013 | INV | | | 4.7 | | 26/06/2013 | | | | | | | |
| 6628-26870 | WW | Qpah | 11.5 | 25/06/2013 | INV | | | 4.1 | | 25/06/2013 | | | | | | | |
| 6628-26885 | WW | Qhck | 4.5 | 23/08/2012 | INV | | | 2.4 | | 23/08/2012 | | | | | | | |
| 6628-26886 | WW | Qhck | 4.5 | 23/08/2012 | INV | | | 2.5 | | 23/08/2012 | | | | | | | |
| 6628-26887 | WW | Qpah | 4.5 | 23/08/2012 | INV | | | 2.4 | | 23/08/2012 | | | | | | | |
| 6628-26888 | WW | Qhck | 4.5 | 23/08/2012 | INV | | | 2.4 | | 23/08/2012 | | | | | | | |
| 6628-26889 | WW | Qhck | 5 | 23/08/2012 | INV | | | 2.4 | | 23/08/2012 | | | | | | | |
| 6628-26890 | WW | Qhck | 4.5 | 23/08/2012 | INV | | | 2.4 | | 23/08/2012 | | | | | | | |
| 6628-26932 | WW | Qpah | 5.5 | 29/05/2013 | INV | | | 4.0 | | 29/05/2013 | | | | | | | |
| 6628-26933 | WW | Qpah | 5.5 | 29/05/2013 | INV | | | 4.0 | | 29/05/2013 | | | | | | | |
| 6628-26934 | WW | Qpah | 5.5 | 29/05/2013 | INV | | | 4.0 | | 29/05/2013 | | | | | | | |
| 6628-26935 | WW | Qpah | 6 | 29/05/2013 | INV | | | 4.0 | | 29/05/2013 | | | | | | | |
| 6628-26936 | WW | Qpah | 5.5 | 30/05/2013 | INV | | | 4.0 | | 30/05/2013 | | | | | | | |
| 6628-26937 | WW | Qpah | 5.5 | 30/05/2013 | INV | | | 4.0 | | 30/05/2013 | | | | | | | |
| 6628-26938 | WW | Qpah | 5.5 | 30/05/2013 | INV | | | 4.0 | | 30/05/2013 | | | | | | | |
| 6628-26939 | WW | Qpah | 5.5 | 30/05/2013 | INV | | | 4.0 | | 30/05/2013 | | | | | | | |
| 6628-26940 | WW | Qpah | 5.5 | 31/05/2013 | INV | | | 4.0 | | 31/05/2013 | | | | | | | |
| 6628-26941 | WW | Qpah | 5.5 | 31/05/2013 | INV | | | 4.0 | | 31/05/2013 | | | | | | | |
| 6628-27109 | WW | Qhck | | 29/08/2013 | | BKF | | | | | | | | | | | |
| 6628-27121 | WW | Qhck | 7 | | | BKF | 29/08/2013 | | | | | | | | | | |
| 6628-27127 | WW | Qpah | 5.8 | 19/03/2013 | INV | | | 4.6 | | 19/03/2013 | | | | | | | |
| 6628-27128 | WW | Qpah | 6.7 | 19/03/2013 | INV | | | 4.5 | | 19/03/2013 | | | | | | | |
| 6628-27144 | WW | Qhck | 7 | | | BKF | 29/08/2013 | | | | | | | | | | |
| 6628-27172 | WW | Qpah | 13 | 14/11/2013 | | | | 6.0 | | 14/11/2013 | 1709 | 3080 | 14/11/2013 | | | 0 | 14/11/2013 |
| 6628-27199 | WW | Qhck | 5.3 | 11/03/2014 | INV | BKF | 8/07/2016 | 2.7 | | 11/03/2014 | | | | | | | |
| 6628-27364 | WW | Qpah | 5 | 9/04/2014 | INV | | | 2.6 | | 9/04/2014 | | | | | | | |
| 6628-27365 | WW | Qpah | 5 | 9/04/2014 | | | | | | | | | | | | | |
| 6628-27366 | WW | Qpah | 5 | 9/04/2014 | INV | | | | | | | | | | | | |
| 6628-27371 | WW | Qpah | 5 | 20/05/2008 | INV | | | 3.0 | | 20/05/2008 | | | | | | | |
| 6628-27457 | WW | Qpah | 10 | | | BKF | 2/03/2012 | 6.9 | | 2/03/2012 | | | | | | | |
| 6628-27458 | WW | Qpah | 10 | | | BKF | 2/03/2012 | | | | | | | | | | |
| 6628-27531 | WW | Qpah | 6 | 14/03/2014 | INV | | | 4.0 | | 14/03/2014 | | | | | | | |
| 6628-27546 | WW | Qpah | 6 | 14/03/2014 | INV | | | 3.5 | | 14/03/2014 | | | | | | | |
| 6628-27547 | WW | Qpah | 6 | 14/03/2014 | INV | | | | | | | | | | | | |
| 6628-27548 | WW | Qpah | 5.5 | 13/03/2014 | INV | | | 3.5 | | 13/03/2014 | | | | | | | |
| 6628-27549 | WW | Qpah | 5.5 | 14/03/2014 | INV | | | 2.8 | | 14/03/2014 | | | | | | | |
| 6628-27700 | WW | Qpah | 9 | 20/10/2014 | INV | | | 3.4 | | 20/10/2014 | | | | | | | |
| 6628-27701 | WW | Qpah | 8.9 | 23/10/2014 | | | | 5.2 | | 23/10/2014 | | | | | | | |
| 6628-27702 | WW | Qpah | 9 | 16/10/2014 | INV | | | 5.9 | | 16/10/2014 | | | | | | | |
| 6628-27703 | WW | Qpah | 9 | 16/10/2014 | INV | | | 5.4 | | 16/10/2014 | | | | | | | |
| 6628-27704 | WW | Qpah | 17.9 | 17/10/2014 | INV | | | 4.4 | | 17/10/2014 | | | | | | | |
| 6628-27705 | WW | Qpah | 17.8 | 21/10/2014 | INV | | | 5.6 | | 21/10/2014 | | | | | | | |
| 6628-27706 | WW | Qpah | 16.4 | 19/10/2014 | INV | | | 4.8 | | 19/10/2014 | | | | | | | |
| 6628-27707 | WW | Qpah | 22.4 | 22/10/2014 | INV | | | 5.3 | | 22/10/2014 | | | | | | | |
| 6628-27708 | WW | Qpah | 20.7 | 23/10/2014 | INV | | | 6.0 | | 23/10/2014 | | | | | | | |
| 6628-27709 | WW | Qpah | 20 | 15/10/2014 | INV | | | 6.0 | | 15/10/2014 | | | | | | | |
| 6628-27724 | WW | Qpah | 5 | 15/04/2015 | INV | | | 4.8 | | 15/04/2015 | | | | | | | |
| 6628-27855 | WW | Qhck | 5.6 | 21/05/2015 | | BKF | 8/07/2016 | 3.2 | | 21/05/2015 | | | | | | | |
| 6628-27856 | WW | Qhck | 5.8 | 21/05/2015 | INV | BKF | 8/07/2016 | 3.5 | | 21/05/2015 | | | | | | | |
| 6628-27857 | WW | Qhck | 5.5 | 20/05/2015 | INV | BKF | 8/07/2016 | 3.0 | | 20/05/2015 | | | | | | | |
| 6628-27858 | WW | Qhck | 7.6 | 20/05/2015 | INV | BKF | 8/07/2016 | 2.8 | | 20/05/2015 | | | | | | | |
| 6628-27898 | WW | Qpah | 17.5 | 7/07/2015 | INV | | | 15.0 | | 7/07/2015 | | | | | | | |
| 6628-28198 | WW | Qpah | 5.5 | 17/06/2015 | INV | | | 3.5 | | 17/06/2015 | | | | | | | |
| 6628-28199 | WW | Qpah | 5.5 | 17/06/2015 | INV | | | 3.2 | | 17/06/2015 | | | | | | | |
| 6628-28200 | WW | Qpah | 5.5 | 17/06/2015 | INV | | | 3.0 | | 17/06/2015 | | | | | | | |
| 6628-28201 | WW | Qpah | 5.5 | 18/06/2015 | INV | | | 3.1 | | 18/06/2015 | | | | | | | |
| 6628-28342 | WW | Qhck | 5.5 | 15/10/2015 | INV | | | 3.2 | | 15/10/2015 | | | | | | | |
| 6628-28343 | WW | Qhck | 5.5 | 15/10/2015 | | | | 3.3 | | 15/10/2015 | | | | | | | |
| 6628-28344 | WW | Qhck | 5.5 | 15/10/2015 | INV | | | 3.1 | | 15/10/2015 | | | | | | | |
| 6628-28345 | WW | Qhck | 5.5 | 15/10/2015 | INV | | | 2.5 | | 15/10/2015 | | | | | | | |
| 6628-28346 | WW | Qhck | 5.5 | 15/10/2015 | INV | | | 3.9 | | 15/10/2015 | | | | | | | |
| 6628-28446 | WW | Qhck | 5 | | | BKF | 8/07/2016 | | | | | | | | | | |
| 6628-28447 | WW | Qhck | 5 | | | BKF | 8/07/2016 | | | | | | | | | | |
| 6628-28469 | WW | Qhck | 6.2 | 1/06/2016 | INV | | | 4.5 | | 1/06/2016 | | | | | | | |
| 6628-28595 | WW | Qpah | 6 | 3/11/2016 | INV | | | | | | | | | | | | |
| 6628-28596 | WW | Qpah | 6 | 3/11/2016 | INV | | | | | | | | | | | | |

GOLDER

# WaterConnect Register Search

**Project Number:** 19131233
**Project:** Albert Park
**Site Address:** Albert Park
**Search Date:** 28/11/2019
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**Status**

| | |
|---|---|
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| BKF: Backfilled | UFL: Uncontrolled flowing |
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**Well Search Summary**

| | | |
|---|---|---|
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| Total number of wells: | | 735 |
| Number of onsite wells: | | 8 |
| Inferred shallow wells (<20 m): | | 632 |
| Salinity in wells (TDS in mg/L) | Min: | 121 |
| | Max: | 50540 |

| Unit_No | Drillhole | Aquifer | Max drill depth | Max drill date | Purpose | Latest status | Latest status date | SWL | RSWL | Water level date | TDS | EC | Salinity date | pH | pH date | Yield | Yield date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6628-28692 | WW | Qhck | 5.5 | 20/06/2016 | INV | | | 3.1 | | 20/06/2016 | | | | | | | |
| 6628-28741 | WW | Qpah | 5 | 10/02/2017 | INV | | | 3.1 | | 10/02/2017 | | | | | | | |
| 6628-28742 | WW | Qpah | 5 | 10/02/2017 | INV | | | 3.4 | | 10/02/2017 | | | | | | | |
| 6628-28743 | WW | Qpah | 5 | 8/03/2017 | INV | | | 3.2 | | 8/03/2017 | | | | | | | |
| 6628-28744 | WW | Qpah | 5 | 9/02/2017 | INV | | | 3.2 | | 9/02/2017 | | | | | | | |
| 6628-28745 | WW | Qpah | 5 | 9/02/2017 | INV | | | 3.3 | | 9/02/2017 | | | | | | | |
| 6628-28771 | WW | Qhck | 5 | 3/04/2017 | INV | BKF | 1/03/2018 | | | 1/03/2018 | | | | | | | |
| 6628-28772 | WW | Qpah | 5 | 4/04/2017 | INV | | | 3.0 | | 4/04/2017 | | | | | | | |
| 6628-28773 | WW | Qpah | 4.5 | 4/04/2017 | INV | | | 2.7 | | 4/04/2017 | | | | | | | |
| 6628-28821 | WW | Qpah | 8 | 27/04/2017 | INV | | | | | | | | | | | | |
| 6628-28822 | WW | Qpah | 7.5 | 27/04/2017 | INV | | | | | | | | | | | | |
| 6628-28823 | WW | Qpah | 7.5 | 27/04/2017 | INV | | | | | | | | | | | | |
| 6628-28824 | WW | Qpah | 7.5 | 27/04/2017 | INV | | | | | | | | | | | | |
| 6628-28825 | WW | Qpah | 7.5 | 27/04/2017 | INV | | | | | | | | | | | | |
| 6628-28966 | WW | Qpah | 6 | 3/07/2017 | INV | BKF | 11/12/2017 | | | | | | | | | | |
| 6628-28967 | WW | Qpah | 5.2 | 3/07/2017 | INV | BKF | 11/12/2017 | | | | | | | | | | |
| 6628-28968 | WW | Qpah | 5 | 3/07/2017 | INV | | | | | | | | | | | | |
| 6628-29276 | WW | Qpah | 6 | 21/12/2017 | INV | | | | | | | | | | | | |
| 6628-29277 | WW | Qpah | 6 | 21/12/2017 | INV | | | | | | | | | | | | |
| 6628-29279 | WW | Qpah | 6 | 21/12/2017 | INV | | | | | | | | | | | | |
| 6628-29306 | WW | Qpah | 4.6 | 21/02/2018 | | | | | | | | | | | | | |
| 6628-29307 | WW | Qpah | 6.8 | 21/02/2018 | | | | | | | | | | | | | |
| 6628-29308 | WW | Qpah | 7 | 21/02/2018 | | | | | | | | | | | | | |
| 6628-29324 | WW | Qpah | 18 | 22/02/2018 | MON | | | 4.5 | | 22/02/2018 | 5498 | 9660 | 26/02/2018 | | | 0 | 21/02/2018 |
| 6628-29325 | WW | Qpah | 6 | 21/02/2018 | MON | | | 4.5 | | 21/02/2018 | 1317 | 2380 | 25/02/2018 | | | 0 | 21/02/2018 |
| 6628-29326 | WW | Qpah | 7.5 | 22/02/2018 | MON | | | 4.7 | | 22/02/2018 | 1452 | 2620 | 25/02/2018 | | | 0 | 22/02/2018 |
| 6628-29327 | WW | Qpah | 6 | 25/02/2018 | MON | | | 4.6 | | 25/02/2018 | 1384 | 2500 | 26/02/2018 | | | 0 | 25/02/2018 |
| 6628-29328 | WW | Qpah | 7.5 | 24/02/2018 | MON | | | 4.9 | | 24/02/2018 | 406 | 739 | 28/02/2018 | | | | 24/02/2018 |
| 6628-29329 | WW | Qpah | 16 | 22/02/2018 | MON | | | 4.5 | | 22/02/2018 | 6361 | 11100 | 26/02/2018 | | | | |
| 6628-29330 | WW | Qpah | 18 | 22/02/2018 | MON | | | 4.9 | | 22/02/2018 | 2295 | 4120 | 26/02/2018 | | | | |
| 6628-29331 | WW | Qpah | 15 | 24/02/2018 | MON | | | 4.9 | | 24/02/2018 | 2188 | 3930 | 26/02/2018 | | | | |
| 6628-29332 | WW | Qpah | 6 | 21/02/2018 | MON | | | 4.5 | | 21/02/2018 | 1002 | 1814 | 24/02/2018 | | | 0 | 20/02/2018 |
| 6628-29333 | WW | Qpah | 13 | 25/02/2018 | MON | | | 4.9 | | 25/02/2018 | 625 | 1135 | 28/02/2018 | | | | |
| 6628-29334 | WW | Qpah | 15 | 25/02/2018 | MON | | | 4.9 | | 25/02/2018 | 1378 | 2490 | 28/02/2018 | | | | |
| 6628-29335 | WW | Qpah | 15 | 23/02/2018 | MON | | | 5.5 | | 23/02/2018 | 2097 | 3770 | 28/02/2018 | | | | |
| 6628-29336 | WW | Qpah | 12.5 | 27/02/2018 | MON | | | 5.0 | | 27/02/2018 | 1856 | 3340 | 28/02/2018 | | | 0 | 27/02/2018 |
| 6628-29337 | WW | Qpah | 6 | 24/02/2018 | MON | | | 5.0 | | 24/02/2018 | 1255 | 2270 | 28/02/2018 | | | 0 | 24/02/2018 |
| 6628-29338 | WW | Qpah | 6 | 24/02/2018 | MON | | | 4.9 | | 24/02/2018 | 1007 | 1824 | 27/02/2018 | | | | 24/02/2018 |
| 6628-29339 | WW | Qpah | 7.5 | 27/02/2018 | MON | | | 5.0 | | 27/02/2018 | 1631 | 2940 | 28/02/2018 | | | 0 | 27/02/2018 |
| 6628-29340 | WW | Qpah | 6 | 27/02/2018 | MON | | | 5.0 | | 27/02/2018 | 2025 | 3640 | 28/02/2018 | | | 0 | 27/02/2018 |
| 6628-29411 | WW | | | 10/04/2018 | | BKF | 10/04/2018 | | | | | | | | | | |
| 6628-29412 | WW | | | 10/04/2018 | | BKF | 10/04/2018 | | | | | | | | | | |
| 6628-29415 | WW | Qpah | 5.2 | 7/12/2017 | | | | 2.8 | | 7/12/2017 | | | | | | | |
| 6628-29417 | WW | Qpah | 5.2 | 7/12/2017 | INV | | | 2.7 | | 7/12/2017 | | | | | | | |
| 6628-29418 | WW | Qpah | 5.3 | 7/12/2017 | INV | | | 2.5 | | 7/12/2017 | | | | | | | |
| 6628-29419 | WW | Qpah | 5.5 | 7/12/2017 | INV | | | 2.5 | | 7/12/2017 | | | | | | | |
| 6628-29420 | WW | Qpah | 5.3 | 7/12/2017 | INV | | | 2.6 | | 7/12/2017 | | | | | | | |
| 6628-29421 | WW | Qpah | 5.5 | 7/12/2017 | INV | | | 2.7 | | 7/12/2017 | | | | | | | |
| 6628-29552 | WW | Qpah | 5 | 18/04/2018 | INV | | | | | | | | | | | | |
| 6628-29553 | WW | Qpah | 5 | 18/04/2018 | INV | | | | | | | | | | | | |
| 6628-29554 | WW | Qpah | 5 | 18/04/2018 | INV | | | | | | | | | | | | |
| 6628-29555 | WW | Qpah | 5.5 | 19/04/2018 | INV | | | | | | | | | | | | |
| 6628-29573 | WW | Qpah | 18 | 23/02/2018 | MON | | | 5.0 | | 23/02/2018 | 4771 | 8420 | 26/02/2018 | | | | |
| 6628-29582 | WW | Qpah | 5.5 | 14/06/2018 | INV | | | | | | | | | | | | |
| 6628-29583 | WW | Qpah | 5.5 | 14/06/2018 | INV | | | | | | | | | | | | |
| 6628-29584 | WW | Qpah | 5.5 | 14/06/2018 | INV | | | | | | | | | | | | |
| 6628-29624 | WW | | 5 | 27/07/2018 | | BKF | 27/07/2018 | 3.5 | | 27/07/2018 | | | | | | | |
| 6628-29625 | WW | | | 27/07/2018 | | BKF | 27/07/2018 | | | | | | | | | | |
| 6628-29726 | WW | | 5.5 | 28/06/2018 | | BKF | 28/06/2018 | 3.5 | | 28/06/2018 | | | | | | | |
| 6628-29727 | WW | | 5 | 28/06/2018 | | BKF | 28/06/2018 | 3.5 | | 28/06/2018 | | | | | | | |
| 6628-29728 | WW | | 5 | 28/06/2018 | | BKF | 28/06/2018 | 3.5 | | 28/06/2018 | | | | | | | |
| 6628-29729 | WW | | 5 | 28/06/2018 | | BKF | 28/06/2018 | 3.5 | | 28/06/2018 | | | | | | | |
| 6628-29872 | WW | Qpah | 6 | 6/12/2018 | ENV | | | | | 6/12/2018 | | | | | | | |
| 6628-29873 | WW | Qpah | 6 | 6/12/2018 | ENV | | | | | | | | | | | | |
| 6628-29880 | WW | Qpah | 6 | 6/12/2018 | ENV | | | | | | | | | | | | |
| 6628-29981 | WW | Qpah | 6.5 | 29/10/2018 | INV | | | | | 29/10/2018 | | | | | | | |
| 6628-29982 | WW | Qpah | 6 | 11/10/2018 | INV | | | | | 11/10/2018 | | | | | | | |
| 6628-29984 | WW | Qpah | 5.5 | 15/10/2018 | INV | | | | | 15/10/2018 | | | | | | | |
| 6628-29985 | WW | Qpah | 6 | 18/10/2018 | INV | | | | | 18/10/2018 | | | | | | | |
| 6628-29986 | WW | Qpah | 5 | 9/10/2018 | INV | | | | | 9/10/2018 | | | | | | | |
| 6628-29987 | WW | Qpah | 6 | 12/10/2018 | INV | | | | | 12/10/2018 | | | | | | | |
| 6628-29988 | WW | Qpah | 6.5 | 12/10/2018 | INV | | | | | 12/10/2018 | | | | | | | |
| 6628-29989 | WW | Qpah | 5.5 | 22/10/2018 | INV | | | | | 22/10/2018 | | | | | | | |
| 6628-29990 | WW | Qpah | 5.5 | 16/10/2018 | INV | | | | | 16/10/2018 | | | | | | | |
| 6628-29992 | WW | Qpah | 5.5 | 19/10/2018 | INV | | | | | 19/10/2018 | | | | | | | |
| 6628-29993 | WW | Qpah | 5.5 | 24/10/2018 | INV | | | | | 24/10/2018 | | | | | | | |
| 6628-29994 | WW | Qpah | 5.5 | 25/10/2018 | INV | | | | | 25/10/2018 | | | | | | | |
| 6628-29995 | WW | Qpah | 5 | 25/10/2018 | INV | | | | | 25/10/2018 | | | | | | | |
| 6628-29996 | WW | Qpah | 5 | 18/10/2018 | INV | | | | | 18/10/2018 | | | | | | | |
| 6628-29997 | WW | Qpah | 5.5 | 19/10/2018 | INV | | | | | 19/10/2018 | | | | | | | |
| 6628-30000 | WW | Qpah | 5 | 17/10/2018 | INV | | | | | 17/10/2018 | | | | | | | |
| 6628-30002 | WW | Qpah | 5 | 17/10/2018 | INV | | | | | 17/10/2018 | | | | | | | |
| 6628-30012 | WW | Qpah | 4.7 | 10/12/2018 | INV | | | | | 10/12/2018 | | | | | | | |
| 6628-30015 | WW | Qpah | 5 | 18/12/2018 | INV | | | | | 18/12/2018 | | | | | | | |
| 6628-30016 | WW | Qpah | 4.9 | 10/12/2018 | INV | | | | | 10/12/2018 | | | | | | | |
| 6628-30017 | WW | Qpah | 5 | 10/12/2018 | INV | | | | | 10/12/2018 | | | | | | | |
| 6628-30018 | WW | Qpah | 5 | 11/12/2018 | INV | | | | | 11/12/2018 | | | | | | | |
| 6628-30019 | WW | Qpah | 5 | 13/12/2018 | INV | | | | | 13/12/2018 | | | | | | | |
| 6628-30020 | WW | Qpah | 5 | 11/12/2018 | INV | | | | | 11/12/2018 | | | | | | | |
| 6628-30022 | WW | Qpah | 5 | 11/12/2018 | INV | | | | | 11/12/2018 | | | | | | | |
| 6628-30035 | WW | Qpah | 6 | 23/10/2018 | INV | | | | | | | | | | | | |
| 6628-30091 | WW | Qpah | 5.2 | 22/02/2019 | INV | | | | | 22/02/2019 | | | | | | | |
| 6628-30094 | WW | Qpah | 5.2 | 21/02/2019 | INV | | | | | 21/02/2019 | | | | | | | |
| 6628-30100 | WW | Qpah | 5.5 | 18/02/2019 | INV | | | | | 18/02/2019 | | | | | | | |
| 6628-30101 | WW | Qpah | 5.2 | 20/02/2019 | INV | | | | | 20/02/2019 | | | | | | | |
| 6628-30102 | WW | Qpah | 5.2 | 21/02/2019 | INV | | | | | 21/02/2019 | | | | | | | |
| 6628-30103 | WW | Qpah | 5.2 | 20/02/2019 | INV | | | | | 20/02/2019 | | | | | | | |
| 6628-30104 | WW | Qpah | 5.2 | 19/02/2019 | INV | | | | | 19/02/2019 | | | | | | | |
| 6628-30165 | WW | Qpah | 8.7 | 1/12/2018 | INV | | | 7.0 | | 15/08/2019 | | | | | | | |
| 6628-30166 | WW | Qpah | 8.5 | 30/11/2018 | INV | | | 6.8 | | 15/08/2019 | | | | | | | |
| 6628-30167 | WW | Qpah | 4 | 29/11/2018 | INV | | | | | | | | | | | | |

GOLDER

# WaterConnect Register Search

**Project Number:** 19131233
**Project:** Albert Park
**Site Address:** Albert Park
**Search Date:** 28/11/2019
**Prepared by:** JGC

**Acronyms**
EC: Electrical Conductivity (µS/cm)
TDS: Total Dissolved Solids (mg/L)
RWL: Relative standing water level
SWL: Standing water level

**Purpose**

| | | |
|---|---|---|
| APN: Anode Protection | FND: Foundations | REC: Recharge |
| APP: Appraisal | GEN: General Usage | RHL: Rock Hole |
| ASR: Aquifer Storage and Recovery | GTH: Geothermal Energy | RIV: River |
| CMT: Construction Materials | HOL: Water Hole | SCI: Scientific |
| COA: Coal | IND: Industrial | SEA: Sea Water |
| DAM: Dam | INV: Investigation | SEI: Seismic Status |
| DEP: Deepening | IRR: Irrigation | SOK: Soak |
| DEV: Development | LAK: Lake | SPR: Spring |
| DOM: Domestic | LWD: Liquid Waste Disposal | STK: Stock |
| DRN: Drainage | MON: Monitoring | TNK: Tank |
| DWT: Dewatering | MWS: Mine Water Supply | TWS: Town Water Supply |
| ENV: Environmental | OBS: Observation | UKN: Uknown |
| ETH: Earthing | PRO: Production | WAS: Waste Disposal |
| EXP: Exploration | RCL: Recreational | |
| FIR: Fire Fighting | RDC: Road Construction / Maintenance | |

**Status**

| | |
|---|---|
| ABD: Abandoned | NOP: Not Operational |
| BKF: Backfilled | UFL: Uncontrolled flowing |
| CFL: Controlled flowing | UKN: Unknown |
| NL: Not located | RHB: Rehabilitated |
| OPR: Operational | |

**Well Search Summary**

| | | |
|---|---|---|
| Search Radius: | | 2 km |
| Total number of wells: | | 735 |
| Number of onsite wells: | | 8 |
| Inferred shallow wells (<20 m): | | 632 |
| Salinity in wells (TDS in mg/L) | Min: | 121 |
| | Max: | 50540 |

| Unit_No | Drillhole | Aquifer | Max drill depth | Max drill date | Purpose | Latest status | Latest status date | SWL | RSWL | Water level date | TDS | EC | Salinity date | pH | pH date | Yield | Yield date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6628-30168 | WW | Qpah | 8 | 27/11/2018 | INV | | | 6.2 | | 15/08/2019 | | | | | | | |
| 6628-30169 | WW | Qpah | 8.5 | 26/11/2018 | INV | | | 6.5 | | 15/08/2019 | | | | | | | |
| 6628-30170 | WW | Qpah | 7 | 22/11/2018 | INV | | | 6.2 | | 15/08/2019 | | | | | | | |
| 6628-30171 | WW | Qpah | 4.5 | 21/11/2018 | INV | | | | | | | | | | | | |
| 6628-30172 | WW | Qpah | 8.5 | 19/11/2018 | INV | | | 6.8 | | 23/08/2019 | | | | | | | |
| 6628-30173 | WW | Qpah | 8 | 13/11/2018 | INV | | | 7.1 | | 15/08/2019 | | | | | | | |
| 6628-30174 | WW | Qpah | 4 | 17/11/2018 | INV | | | | | | | | | | | | |
| 6628-30175 | WW | Qpah | 10 | 16/11/2018 | INV | | | 6.0 | | 16/11/2018 | | | | | | | |
| 6628-30176 | WW | Qpah | 10 | 14/11/2018 | INV | | | | | | | | | | | | |
| 6628-30177 | WW | Qpah | 10 | 15/11/2018 | INV | | | | | | | | | | | | |
| 6628-30180 | WW | Qhck | 5.5 | 17/04/2019 | ENV | | | | | 17/04/2019 | | | | | | | |
| 6628-30181 | WW | Qhck | 5.5 | 17/04/2019 | ENV | | | | | 17/04/2019 | | | | | | | |
| 6628-30182 | WW | Qhck | 5.5 | 17/04/2019 | ENV | | | | | 17/04/2019 | | | | | | | |
| 6628-30223 | WW | Qpah | 5.5 | 23/05/2019 | INV | | | | | 23/05/2019 | | | | | | | |
| 6628-30225 | WW | Qpah | 5.5 | 23/05/2019 | INV | | | | | 23/05/2019 | | | | | | | |
| 6628-30236 | WW | Qpah | 26 | 15/05/2019 | INV | DRY | 15/05/2019 | | | 15/05/2019 | | | | | | | |
| 6628-30237 | WW | Qpah | 9 | 9/05/2019 | INV | | | | | | | | | | | | |
| 6628-30238 | WW | Qpah | 26 | 14/05/2019 | INV | | | | | | | | | | | | |
| 6628-30239 | WW | Qpah | 9 | 9/05/2019 | INV | | | | | | | | | | | | |
| 6628-30240 | WW | Qpah | 9 | 10/05/2019 | INV | | | | | | | | | | | | |
| 6628-30241 | WW | Qpah | 9 | 10/05/2019 | INV | | | | | | | | | | | | |
| 6628-30243 | WW | Qpah | 34 | 13/05/2019 | INV | DRY | 13/05/2019 | | | 13/05/2019 | | | | | | | |
| 6628-30290 | WW | Qpah | 5.6 | 9/07/2019 | INV | | | | | | | | | | | | |
| 6628-30291 | WW | Qpah | 6 | 23/10/2018 | INV | | | | | 23/10/2018 | | | | | | | |
| 6628-30295 | WW | Qpah | 8 | 20/05/2019 | MON | | | | | 20/05/2019 | | | | | | | |
| 6628-30296 | WW | Qpah | 8 | 21/05/2019 | MON | DRY | 21/05/2019 | | | 21/05/2019 | | | | | | | |
| 6628-30297 | WW | Qpah | 8 | 21/05/2019 | MON | DRY | 21/05/2019 | | | 21/05/2019 | | | | | | | |
| 6628-30298 | WW | Qpah | 8 | 20/05/2019 | MON | DRY | 20/05/2019 | | | 20/05/2019 | | | | | | | |
| 6628-30299 | WW | Qpah | 8 | 20/05/2019 | MON | DRY | 20/05/2019 | | | 20/05/2019 | | | | | | | |
| 6628-30447 | WW | | | 12/07/2019 | | BKF | 12/07/2019 | | | 12/07/2019 | | | | | | | |
| 6628-30457 | WW | | 6 | 9/07/2019 | INV | DRY | 9/07/2019 | | | 9/07/2019 | | | | | | | |
| 6628-30458 | WW | | 5.5 | 9/07/2019 | INV | DRY | 9/07/2019 | | | 9/07/2019 | | | | | | | |
| 6628-8619 | WW | Qhck | 2.9 | 15/01/1952 | | | | 1.8 | 0.2 | 15/01/1952 | 7150 | 12455 | 15/01/1952 | | | 0 | 15/01/1952 |
| 6628-8620 | WW | Tomw(T1) | 118.87 | 22/01/1946 | | | | 4.3 | -0.1 | 30/01/1946 | 4550 | 8046 | 5/12/1946 | | | 25 | 6/03/1946 |
| 6628-8622 | WW | Tomw(T1) | 212.45 | 10/12/1970 | IRR | UKN | 10/12/1970 | 21.3 | -19.3 | 10/12/1970 | 1479 | 2670 | 27/02/1973 | 8 | 27/02/1973 | 11 | 1/01/1973 |
| 6628-8623 | WW | Tomw(T2) | 210 | 16/08/1978 | | BKF | 15/10/1980 | 1.5 | 3.0 | 16/08/1978 | 1105 | 2000 | 24/10/1978 | 8 | 24/10/1978 | 15 | 16/08/1978 |
| 6628-8624 | WW | Qhck | 6.1 | 15/11/1967 | | | | 1.5 | 2.8 | 15/11/1967 | 3245 | 5789 | 15/11/1967 | 7 | 15/11/1967 | | |
| 6628-8625 | ENG | Qpah | 6.4 | 14/02/1961 | | | | 2.6 | 1.9 | 14/02/1961 | | | | | | | |
| 6628-8626 | WW | Tomw(T1) | 158.19 | 30/11/1934 | | | | 16.8 | -12.1 | 30/11/1934 | 1013 | 1834 | 30/11/1934 | | | 1 | 30/11/1934 |
| 6628-8627 | WW | Tomw(T1) | 177.7 | 29/06/1951 | | UKN | 29/06/1951 | 15.2 | -11.2 | 29/06/1951 | 1514 | 2732 | 15/06/1951 | | | 9 | 29/06/1951 |
| 6628-8628 | WW | Qpah | 49.38 | 12/04/1946 | | UKN | 12/04/1946 | 2.7 | 1.3 | 12/04/1946 | 34386 | 52352 | 12/04/1946 | | | 4 | 12/04/1946 |
| 6628-8629 | WW | Qpah | 91.44 | 1/04/1940 | | | | | | | 10110 | 17287 | 22/05/1940 | | | | |
| 6628-8630 | WW | Tomw(T1) | 182.88 | 1/04/1972 | IRR | OPR | | 16.8 | -12.0 | 23/10/1972 | 699 | 1270 | 23/10/1972 | 7 | 23/10/1972 | 15 | 23/10/1972 |
| 6628-8631 | WW | | | | | | | 0.9 | 3.8 | 26/01/1954 | 3689 | 6562 | 26/01/1954 | | | | |
| 6628-8634 | WW | Tomw(T1) | 114.3 | 1/02/1934 | | | | | 4.5 | 1/01/1934 | 999 | 1809 | 1/01/1934 | | | 4 | 1/01/1934 |
| 6628-8635 | WW | Tomw(T1) | 128.93 | 10/06/1971 | IRROBS | OPR | 1/01/1991 | 12.8 | -8.4 | 3/09/2008 | 50540 | 72200 | 9/09/2008 | 8 | 16/03/1988 | 4 | 10/06/1971 |
| 6628-8636 | WW | Tomw(T1) | 176.78 | 1/03/1934 | | | | 9.3 | -4.7 | 7/03/1947 | 899 | 1631 | 13/07/1948 | | | 6 | 7/03/1947 |
| 6628-8637 | WW | Tomw(T1) | 134.72 | 2/03/1947 | | | | 13.1 | -8.5 | 2/03/1947 | 686 | 1245 | 7/03/1947 | | | 5 | 2/03/1947 |
| 6628-8638 | WW | Qpah | 91.44 | | | | | | | | | | | | | | |
| 6628-8639 | WW | Tomw(T1) | 111.25 | 24/11/1935 | | | | | | | 817 | 1482 | 24/11/1935 | | | | |
| 6628-8642 | WW | Qhck | 3.66 | 15/10/1914 | | | | | | | 3374 | 6012 | 15/10/1914 | | | | |
| 6628-8643 | WW | Qhck | 6.1 | 5/10/1914 | | | | | | | 6663 | 11627 | 5/10/1914 | | | | |
| 6628-8644 | WW | Qhck | 4.88 | 8/08/1945 | | | | 2.4 | 1.6 | 8/08/1945 | 11838 | 20024 | 8/08/1945 | | | | |
| 6628-8645 | WW | Qhck | 6.4 | 2/08/1945 | | | | 3.1 | 1.1 | 2/08/1945 | 4669 | 8251 | 2/08/1945 | | | | |
| 6628-8646 | WW | Qhck | 4.57 | 26/10/1949 | | | | 1.5 | 2.7 | 26/10/1949 | 2359 | 4234 | 26/10/1949 | | | | |
| 6628-8647 | WW | Qhck | 3.05 | 1/01/1967 | | | | 1.8 | 2.5 | 1/01/1967 | 1115 | 2018 | 1/01/1967 | 7 | 1/01/1967 | | |
| 6628-8648 | WW | Qpah | | 1/09/1934 | | | | 2.1 | 2.4 | 1/09/1934 | 9380 | 16098 | 1/09/1934 | | | | |
| 6628-8649 | WW | Qhck | | 1/09/1934 | | | | 1.7 | 3.0 | 1/09/1934 | 3817 | 6784 | 13/09/1934 | | | | |
| 6628-8650 | WW | Qhck | | 1/09/1934 | | | | 2.1 | 2.6 | 1/09/1934 | 10453 | 17841 | 13/09/1934 | | | | |
| 6628-8651 | WW | Qhck | | 1/09/1934 | | | | 2.3 | 2.5 | 1/09/1934 | 2469 | 4427 | 13/09/1934 | | | | |
| 6628-8652 | WW | Qhck | | 1/09/1934 | | | | 1.7 | 3.1 | 1/09/1934 | 3517 | 6262 | 1/09/1934 | | | | |
| 6628-8655 | WW | Tomw(T1) | 199.8 | 30/11/1967 | | BKF | 3/11/1986 | 17.4 | -12.6 | 9/01/1969 | 873 | 1584 | 12/03/1987 | 8 | 12/03/1987 | 8 | 9/01/1969 |
| 6628-8659 | WW | Qpah | 9.14 | | | | | | | | | | | | | | |
| 6628-8678 | WW | Qpah | 40.23 | 13/02/1930 | | | | 9.1 | -4.2 | 13/02/1930 | 1799 | 3241 | 13/02/1930 | | | 1 | 13/02/1930 |
| 6628-8680 | WW | Qpah | 4.72 | 22/06/1951 | | | | 2.7 | 2.2 | 22/06/1951 | 6463 | 11301 | 22/06/1951 | | | | |
| 6628-8681 | WW | | | | | | | | | | 6434 | 11250 | 23/02/1956 | | | | |
| 6628-8682 | WW | Tomw(T1) | 123.44 | 1/01/1946 | | | | 11.3 | -5.5 | 5/03/1947 | 671 | 1218 | 5/03/1947 | | | 8 | 5/03/1947 |
| 6628-8683 | WW | Qpah | 9.14 | | | | | | | | | | | | | 9 | |
| 6628-8684 | WW | Qpah | 24.38 | 15/08/1934 | | | | | | | 4612 | 8153 | 15/08/1934 | | | | |
| 6628-8685 | WW | Tomw(T1) | 191.72 | 4/12/1934 | | | | 4.6 | 0.7 | 10/02/1940 | 6197 | 10856 | 10/02/1940 | | | 8 | 4/12/1934 |
| 6628-8686 | WW | Qpah | 9.14 | 5/01/1945 | | | | 6.4 | -0.4 | 5/01/1945 | 4633 | 8190 | 5/01/1945 | | | 1 | 5/01/1945 |
| 6628-8687 | WW | Qpah | 3.05 | 25/02/1969 | | | | | | | 3030 | 5413 | 25/02/1969 | 8 | 25/02/1969 | | |
| 6628-8688 | WW | Qpah | 15.24 | 1/03/1934 | | | | 4.6 | 1.4 | 1/03/1934 | 3717 | 6609 | 1/03/1934 | | | 15 | 1/03/1934 |
| 6628-8689 | WW | Tomw(T1) | 119.18 | 1/01/1945 | | | | 5.8 | -0.7 | 1/01/1946 | 713 | 1294 | 5/03/1947 | | | 6 | 1/01/1947 |
| 6628-8690 | WW | Qpah | 15.24 | 1/03/1934 | | | | 4.6 | 1.4 | 1/03/1934 | 3698 | 6578 | 1/03/1934 | | | 19 | 1/03/1934 |
| 6628-8691 | WW | Qpah | 15.24 | 1/03/1934 | | | | 4.6 | 1.4 | 1/03/1934 | 3717 | 6609 | 1/03/1934 | | | 13 | 1/03/1934 |
| 6628-8692 | WW | Tomw(T1) | 131.98 | 18/12/1945 | OBS | RHB | 22/10/1992 | 6.5 | -0.5 | 25/09/2019 | 707 | 1283 | 4/12/2014 | 8 | 22/10/1992 | 3 | 22/10/1992 |
| 6628-8693 | WW | Qpah | 10.06 | | | | | | | | | | | | | | |
| 6628-8734 | WW | Qpah | 18.29 | 21/01/1947 | | | | 13.4 | -6.9 | 21/01/1947 | 1859 | 3349 | 21/01/1947 | | | | |
| 6628-8735 | WW | Qpah | 16.76 | 3/03/1934 | | | | | | | 2500 | 4482 | 3/03/1934 | | | | |
| 6628-8736 | WW | Qpah | 18.29 | | | | | 6.1 | 0.9 | | | | | | | 15 | |
| 6628-8737 | WW | Qpah | 12.19 | | | | | 8.5 | -1.8 | | | | | | | | |
| 6628-8742 | WW | Qpah | 16.76 | 3/03/1934 | | | | | | | 2500 | 4482 | 3/03/1934 | | | | |
| 6628-8743 | WW | Qpah | 15.24 | 3/03/1934 | | | | | | | 2500 | 4482 | 3/03/1934 | | | | |
| 6628-8747 | ENG | Qpah | 15.54 | 21/07/1966 | | UKN | 21/07/1966 | | | | | | | | | | |
| 6628-8748 | ENG | Qpah | 30.33 | 12/07/1966 | | UKN | 12/07/1966 | | | | | | | | | | |
| 6628-8749 | ENG | Qpah | 15.7 | 26/07/1966 | | UKN | 26/07/1966 | | | | | | | | | | |
| 6628-8751 | ENG | Qpah | 12.5 | 16/11/1954 | | UKN | 16/11/1954 | 3.7 | 4.9 | 16/11/1954 | | | | | | | |
| 6628-8752 | ENG | Qpah | 12.19 | 10/11/1954 | | UKN | 10/11/1954 | 3.7 | 4.7 | 10/11/1954 | | | | | | | |
| 6628-8753 | WW | Qpah | 6.1 | 1/09/1949 | | | | | | | 4198 | 7441 | 1/09/1949 | | | | |
| 6628-8754 | WW | Tomw(T1) | 131.37 | 24/11/1967 | TWS | BKF | 18/04/1973 | 52.0 | -43.4 | 23/10/1977 | 775 | 1405 | 10/02/1975 | | | 6 | 23/10/1977 |
| 6628-8755 | WW | Qpah | 6.1 | 10/02/1958 | | | | 4.3 | 4.2 | 10/02/1958 | 3031 | 5414 | 10/02/1958 | | | | |
| 6628-8804 | WP | | | | | | | | | | 8210 | 14194 | 6/04/1934 | | | | |
| 6628-8805 | WW | Qpah | 4.27 | 12/02/1968 | | | | | | | 3245 | 5789 | 12/02/1968 | 7 | 12/02/1968 | | |
| 6628-8806 | WW | Qpah | 4.88 | 12/02/1968 | | | | | | | 3315 | 5911 | 12/02/1968 | 7 | 12/02/1968 | | |
| 6628-8807 | WW | Qpah | 2.44 | 18/11/1954 | | | | 2.3 | 3.3 | 18/11/1954 | 5004 | 8823 | 18/11/1954 | | | | |
| 6628-8808 | WW | Qpah | 4.88 | 20/09/1945 | | | | 2.7 | 3.8 | 20/09/1945 | 2670 | 4782 | 20/09/1945 | | | | |
| 6628-8809 | WW | Qpah | 24.38 | 18/09/1945 | | | | | | | 3684 | 6553 | 1/01/1949 | | | | |
| 6628-8810 | WW | Qpah | 85.34 | 1/01/1948 | | | | | | | | | | | | 9 | 1/01/1948 |
| 6628-8811 | WW | Tomw(T1) | 124.05 | 1/01/1935 | | BKF | 7/08/1984 | | 7.5 | 10/12/1914 | 1884 | 3394 | 1/10/1936 | | | 13 | 1/01/1935 |
| 6628-8812 | WW | Qpah | 76.81 | 1/01/1925 | DRN | | | 4.6 | 3.4 | 1/01/1925 | | | | | | | |

GOLDER

**WaterConnect Register Search**

**Project Number:** 19131233
**Project:** Albert Park
**Site Address:** Albert Park
**Search Date:** 28/11/2019
**Prepared by:** JGC

**Acronyms**
EC: Electrical Conductivity (µS/cm)
TDS: Total Dissolved Solids (mg/L)
RWL: Relative standing water level
SWL: Standing water level

**Purpose**

| | | |
|---|---|---|
| APN: Anode Protection | FND: Foundations | REC: Recharge |
| APP: Appraisal | GEN: General Usage | RHL: Rock Hole |
| ASR: Aquifer Storage and Recovery | GTH: Geothermal Energy | RIV: River |
| CMT: Construction Materials | HOL: Water Hole | SCI: Scientific |
| COA: Coal | IND: Industrial | SEA: Sea Water |
| DAM: Dam | INV: Investigation | SEI: Seismic Status |
| DEP: Deepening | IRR: Irrigation | SOK: Soak |
| DEV: Development | LAK: Lake | SPR: Spring |
| DOM: Domestic | LWD: Liquid Waste Disposal | STK: Stock |
| DRN: Drainage | MON: Monitoring | TNK: Tank |
| DWT: Dewatering | MWS: Mine Water Supply | TWS: Town Water Supply |
| ENV: Environmental | OBS: Observation | UKN: Uknown |
| ETH: Earthing | PRO: Production | WAS: Waste Disposal |
| EXP: Exploration | RCL: Recreational | |
| FIR: Fire Fighting | RDC: Road Construction / Maintenance | |

**Status**

| | |
|---|---|
| ABD: Abandoned | NOP: Not Operational |
| BKF: Backfilled | UFL: Uncontrolled flowing |
| CFL: Controlled flowing | UKN: Unknown |
| NL: Not located | RHB: Rehabilitated |
| OPR: Operational | |

**Well Search Summary**

| | | |
|---|---|---|
| Search Radius: | | 2 km |
| Total number of wells: | | 735 |
| Number of onsite wells: | | 8 |
| Inferred shallow wells (<20 m): | | 632 |
| Salinity in wells (TDS in mg/L) | Min: | 121 |
| | Max: | 50540 |

| Unit_No | Drillhole | Aquifer | Max drill depth | Max drill date | Purpose | Latest status | Latest status date | SWL | RSWL | Water level date | TDS | EC | Salinity date | pH | pH date | Yield | Yield date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6628-8813 | WW | Tomw(T1) | 128.02 | 25/10/1934 | | | | 2.4 | 4.9 | 1/01/1934 | 1013 | 1834 | 22/04/1943 | | | 15 | 1/01/1934 |
| 6628-8814 | WW | Qpah | 36.58 | 9/01/1946 | | | | 6.1 | 0.2 | 9/01/1946 | 1113 | 2014 | 9/01/1946 | | | | |
| 6628-8815 | WW | Qpah | 9.14 | 26/05/1934 | | | | | | | 4583 | 8102 | 26/05/1934 | | | | |
| 6628-8816 | WW | Qpah | | | DRN | | | | | | | | | | | | |
| 6628-8817 | WW | Tomw(T1) | 152.4 | 3/06/1970 | DRN | OPR | | 19.2 | -11.0 | 3/06/1970 | 555 | 1009 | 2/06/1970 | 7 | 2/06/1970 | 1 | 3/06/1970 |
| 6628-8818 | WW | Qpah | 67.06 | 3/08/1951 | DRN | | | | | | | | | | | 2 | 3/08/1951 |
| 6628-8819 | WW | Qpah | 15.39 | 10/07/1929 | | | | 14.6 | -6.0 | 10/07/1929 | | | | | | | |
| 6628-8820 | ENG | Qpah | 4.88 | 1/10/1963 | | | | 2.4 | 5.8 | 1/10/1963 | | | | | | | |
| 6628-8821 | WW | Qpah | 9.14 | 6/10/1914 | | | | | | | 2173 | 3904 | 6/10/1914 | | | | |
| 6628-8823 | WW | Tomw(T1) | 110.34 | 21/11/1945 | OBS | BKF | 15/10/1997 | 13.7 | -5.0 | 15/09/1997 | 519 | 943 | 14/11/1984 | 7 | 14/11/1984 | 23 | 18/10/1949 |
| 6628-8827 | WW | Qpah | 9.14 | 6/10/1914 | | | | | | | 1887 | 3399 | 6/10/1914 | | | | |
| 6628-8828 | WW | Qpah | 3.96 | 21/12/1953 | | | | 3.2 | 6.5 | 21/12/1953 | 2830 | 5063 | 21/12/1953 | | | | |
| 6628-8829 | WW | Qpah | 9.14 | 25/07/1945 | | | | | | | 5526 | 9709 | 25/07/1945 | | | 4 | 1/01/1945 |
| 6628-8830 | WW | Qpah | 27.43 | 23/01/1945 | | | | | | | 2960 | 5291 | 23/01/1945 | | | 5 | 1/01/1945 |
| 6628-8834 | WW | Qpah | 6.1 | 8/01/1968 | | | | 4.3 | 4.2 | 8/01/1968 | 4430 | 7841 | 8/01/1968 | 7 | 8/01/1968 | | |
| 6628-8838 | WP | | | | | | | | | | 15136 | 25155 | 22/03/1934 | | | | |
| 6628-8839 | WW | Qpah | 3.05 | 12/01/1945 | | | | 1.8 | 2.2 | 12/01/1945 | 5911 | 10374 | 12/01/1945 | | | 0 | 12/01/1945 |
| 6628-8839 | WW | Qpah | 3.05 | 12/01/1945 | | | | 1.8 | 2.2 | 12/01/1945 | 5911 | 10374 | 12/01/1945 | | | 0 | 12/01/1945 |
| 6628-8840 | WW | Qpah | 4.27 | 12/01/1945 | | | | 1.8 | 2.2 | 12/01/1945 | 6383 | 11161 | 12/01/1945 | | | 0 | 12/01/1945 |
| 6628-8840 | WW | Qpah | 4.27 | 12/01/1945 | | | | 1.8 | 2.2 | 12/01/1945 | 6383 | 11161 | 12/01/1945 | | | 0 | 12/01/1945 |
| 6628-8841 | WW | Qpah | 6.1 | 3/01/1945 | | | | 2.4 | 1.6 | 3/01/1945 | 9424 | 16173 | 3/01/1945 | | | 0 | 3/01/1945 |
| 6628-8841 | WW | Qpah | 6.1 | 3/01/1945 | | | | 2.4 | 1.6 | 3/01/1945 | 9424 | 16173 | 3/01/1945 | | | 0 | 3/01/1945 |
| 6628-8842 | WP | Qpah | | 6/04/1934 | | | | | | | 10738 | 18295 | 6/04/1934 | | | | |
| 6628-8842 | WP | Qpah | | 6/04/1934 | | | | | | | 10738 | 18295 | 6/04/1934 | | | | |
| 6628-8847 | WW | Tomw(T1) | 102.11 | 19/07/1963 | | | | 9.8 | -2.3 | 19/07/1963 | 2262 | 4060 | 19/11/1986 | 7 | 19/11/1986 | 6 | 19/07/1963 |
| 6628-8847 | WW | Tomw(T1) | 102.11 | 19/07/1963 | | | | 9.8 | -2.3 | 19/07/1963 | 2262 | 4060 | 19/11/1986 | 7 | 19/11/1986 | 6 | 19/07/1963 |
| 6628-8848 | WW | Qpah | 9.45 | 22/07/1963 | DRN | OPR | | | | | | | | | | | |
| 6628-8848 | WW | Qpah | 9.45 | 22/07/1963 | DRN | OPR | | | | | | | | | | | |

Government of South Australia

SA Water

# South Australian Water Corporation

## WASTEWATER RETICULATION

DBYD Sequence No: **90041694**

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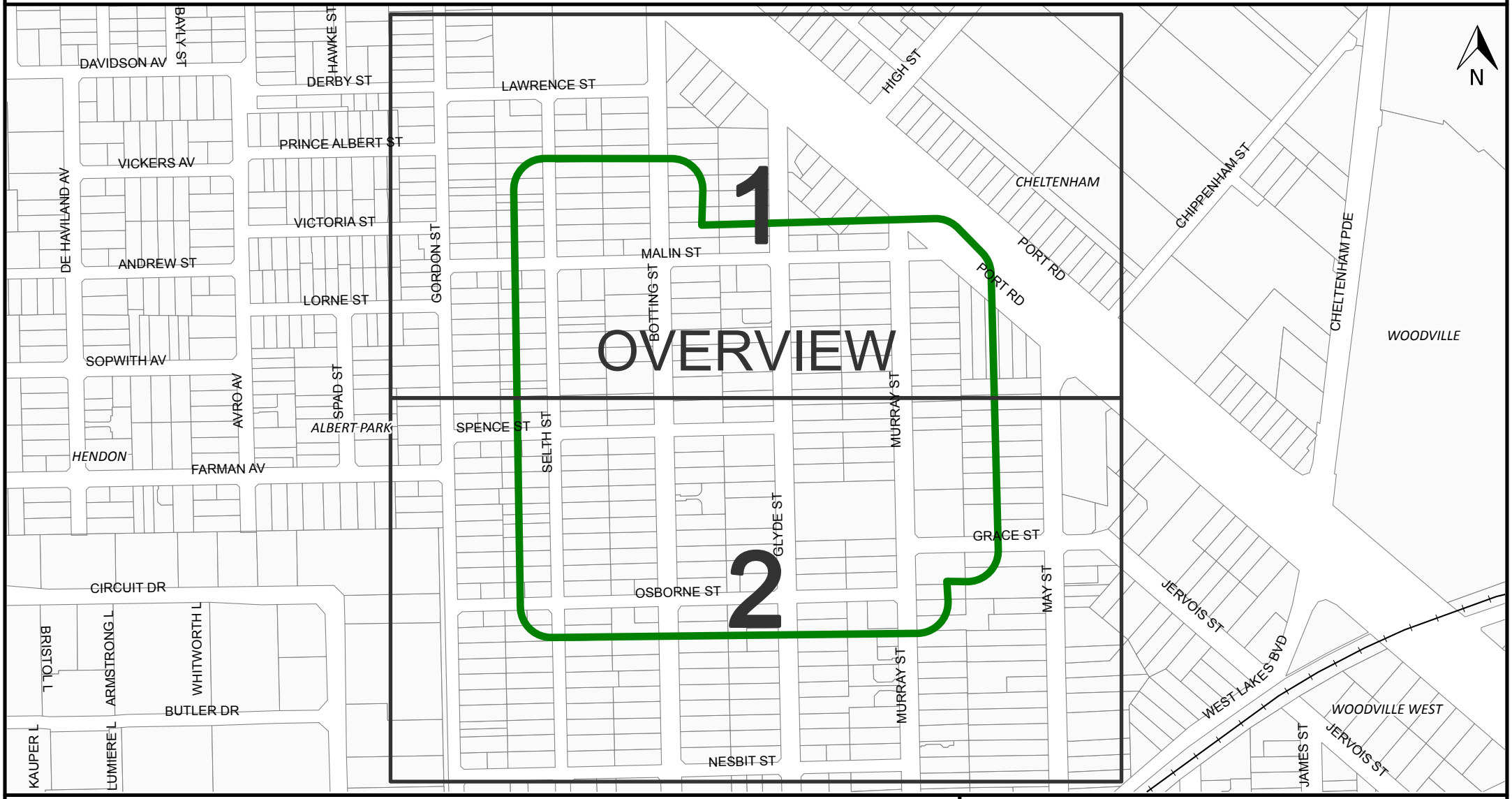


- GIP
- Valve
- Maintenance Hole
- Maintenance Shaft
- Inspection Opening
- Wastewater Connections
- Decommissioned Asbestos Mains
- Ancillary Pipes
- Gravity Mains
- Low Pressure
- Pumping Mains
- Vacuum Mains
- Railway
- Land Parcels
- CP Facility
- CP Anode/Cathode Cables
- CP Electricity Supply Cables
- CP Anode Bed Outlines

CP = Cathodic Protection

Scale @ A4: 1:5119

Government of South Australia

SA Water

# South Australian Water Corporation

## WASTEWATER RETICULATION

DBYD Sequence No: **90041694**

Map Tile: 1

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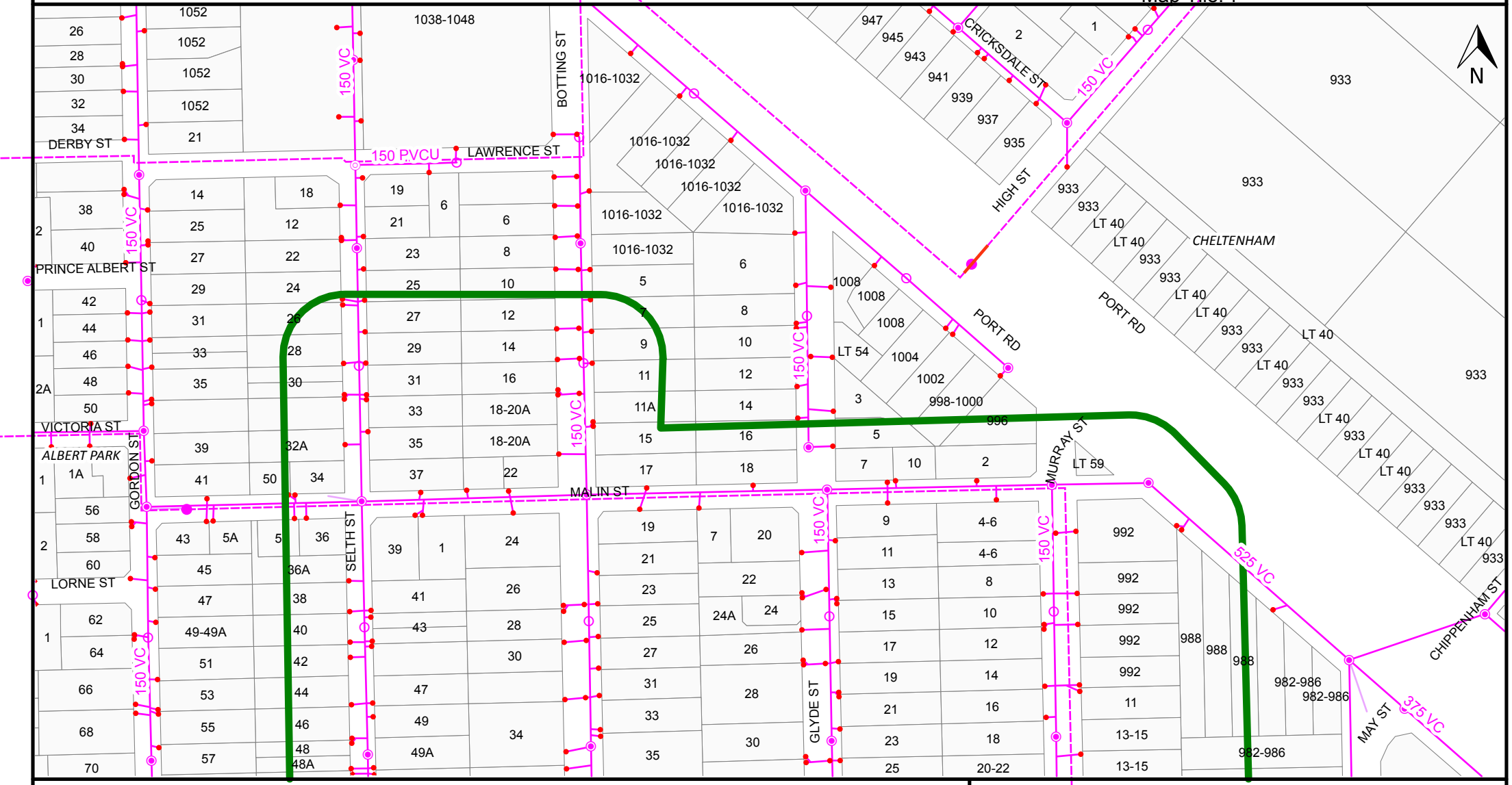


- GIP
- Valve
- Maintenance Hole
- Maintenance Shaft
- Inspection Opening
- Wastewater Connections
- Decommissioned Asbestos Mains
- Ancillary Pipes
- Gravity Mains
- Low Pressure
- Pumping Mains
- Vacuum Mains
- Railway
- Land Parcels
- CP Facility
- CP Anode/Cathode Cables
- CP Electricity Supply Cables
- CP Anode Bed Outlines
- CP = Cathodic Protection

Scale @ A4: 1:2500

Government of South Australia

SA Water

# South Australian Water Corporation

## WASTEWATER RETICULATION

DBYD Sequence No: **90041694**

Map Tile: 2

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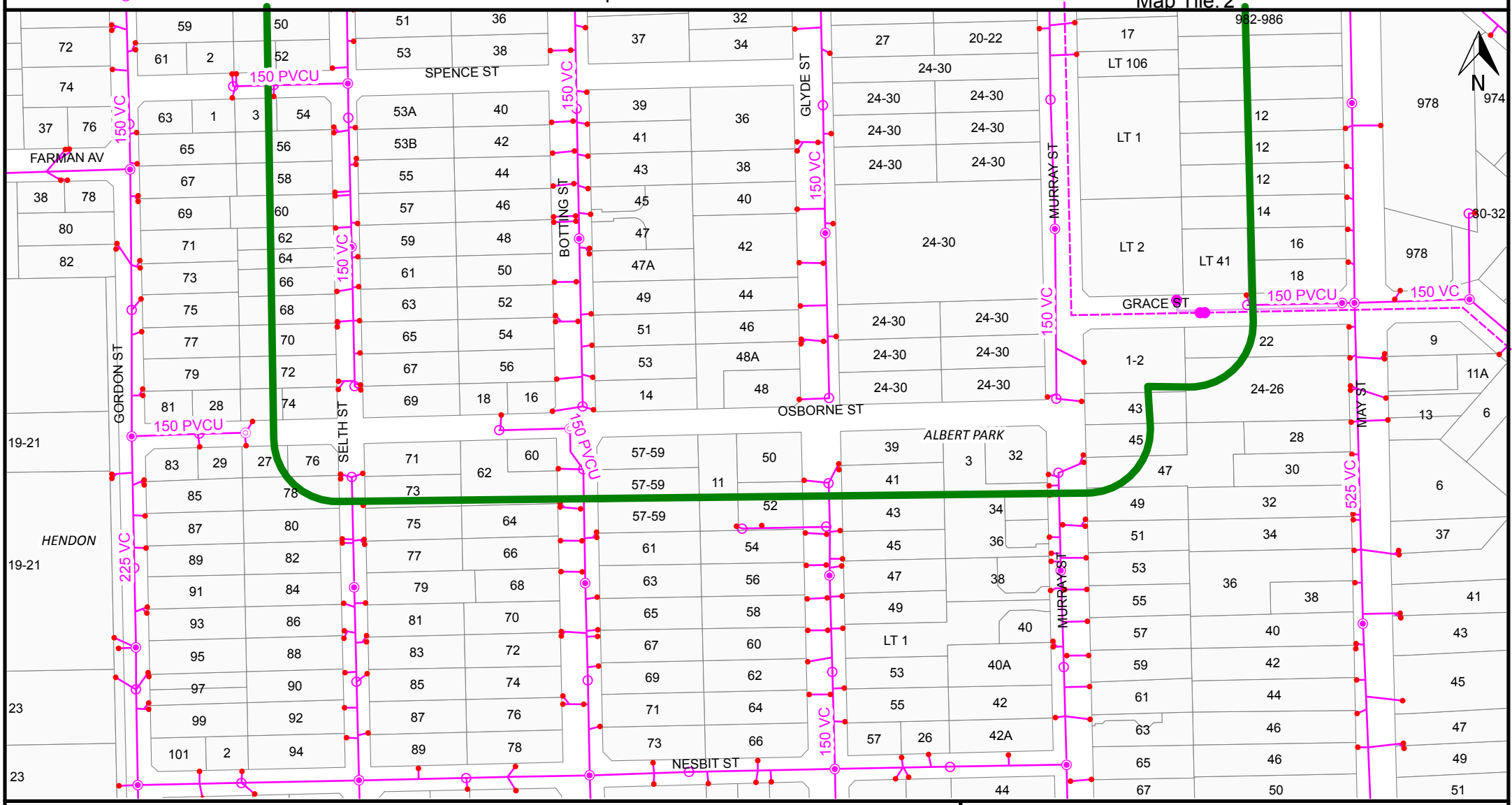


- GIP
- Valve
- Maintenance Hole
- Maintenance Shaft
- Inspection Opening
- Wastewater Connections
- Decommissioned Asbestos Mains
- Ancillary Pipes
- Gravity Mains
- Low Pressure
- Pumping Mains
- Vacuum Mains
- Railway
- Land Parcels
- CP Facility
- CP Anode/Cathode Cables
- CP Electricity Supply Cables
- CP Anode Bed Outlines

CP = Cathodic Protection

Scale @ A4: 1:2500

**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

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*The Essential First Step.*


Legend | Scale: 1:3280 | Overview

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
- Gross Pollutant Trap
- Valve
- Water Meter
- RW Supply Main
- RW Supply Connection
- Communications & Electrical
- Cadastre
- Council Boundary
- State Council Boundaries

N

**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

DIAL BEFORE YOU DIG www.1100.com.au
*The Essential First Step.*


Legend | Scale: 1:800 | Tile No: 1

City of Charles Sturt

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
- Gross Pollutant Trap
- Valve
- Water Meter
- RW Supply Main
- RW Supply Connection
- Communications & Electrical
- Cadastre
- Council Boundary
- State Council Boundaries

N

**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

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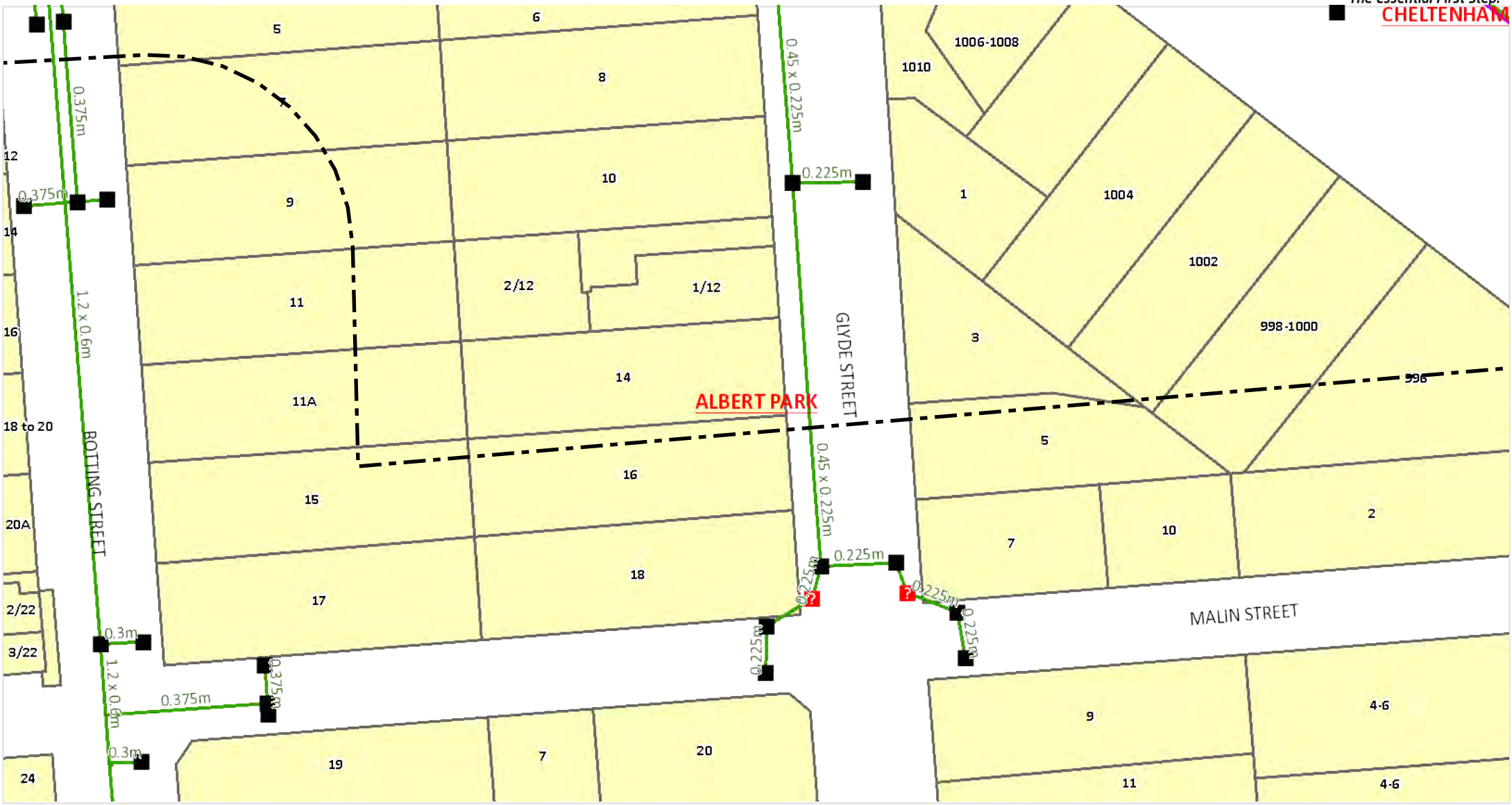
*The Essential First Step.*




Legend | Scale: 1:800 | Tile No: 2

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
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- Valve
- Water Meter
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- Communications & Electrical
- Cadastre
- Council Boundary
- State Council Boundaries

N

**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

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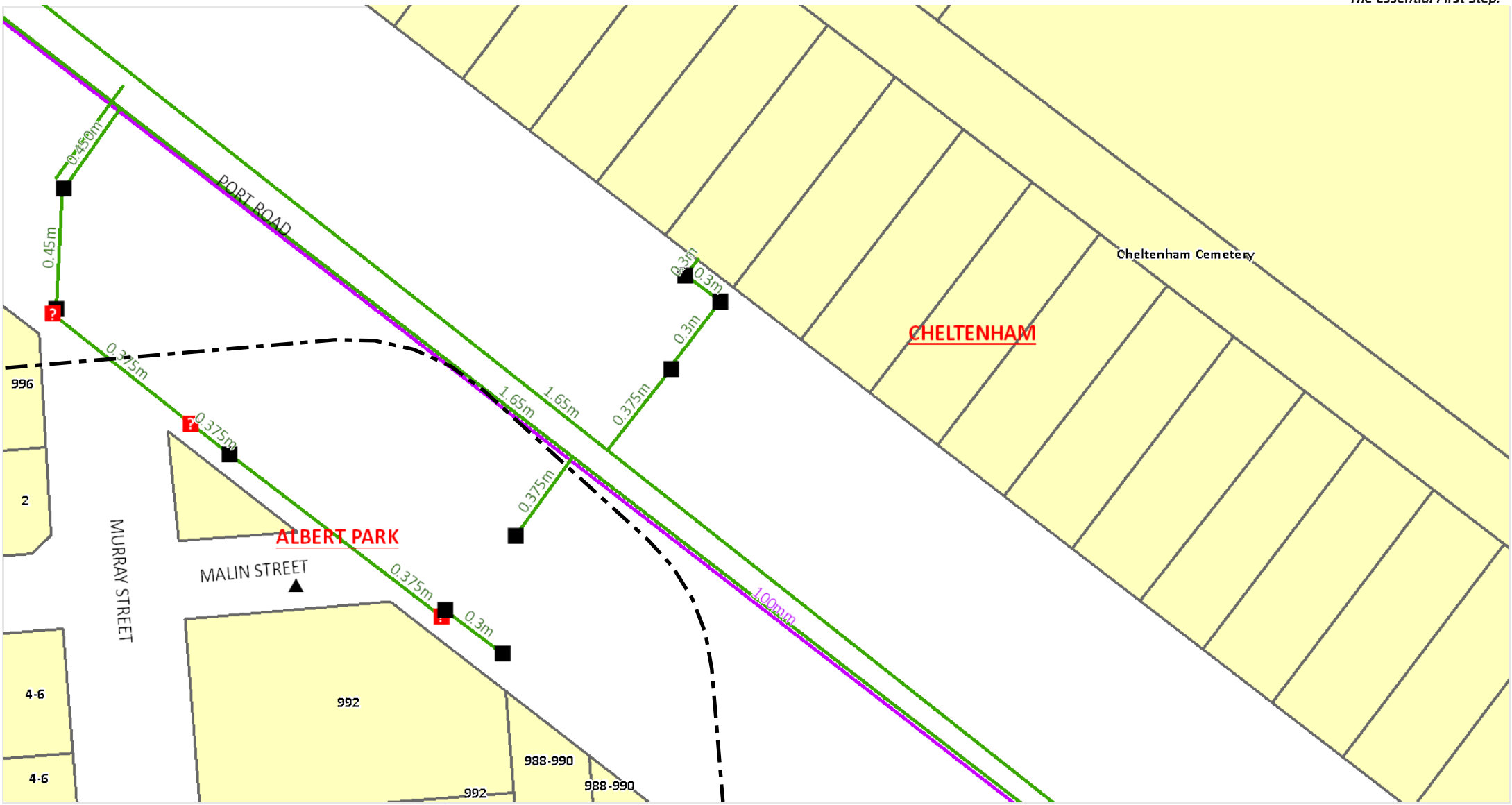
*The Essential First Step.*




Legend | Scale: 1:800 | Tile No: 3

City of Charles Sturt

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
- Gross Pollutant Trap
- Valve
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- RW Supply Connection
- Communications & Electrical
- Cadastre
- Council Boundary
- State Council Boundaries

N

**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

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Legend | Scale: 1:800 | Tile No: 4

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
- Gross Pollutant Trap
- Valve
- Water Meter
- RW Supply Main
- RW Supply Connection
- Communications & Electrical
- Cadastre
- Council Boundary
- State Council Boundaries

N

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**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

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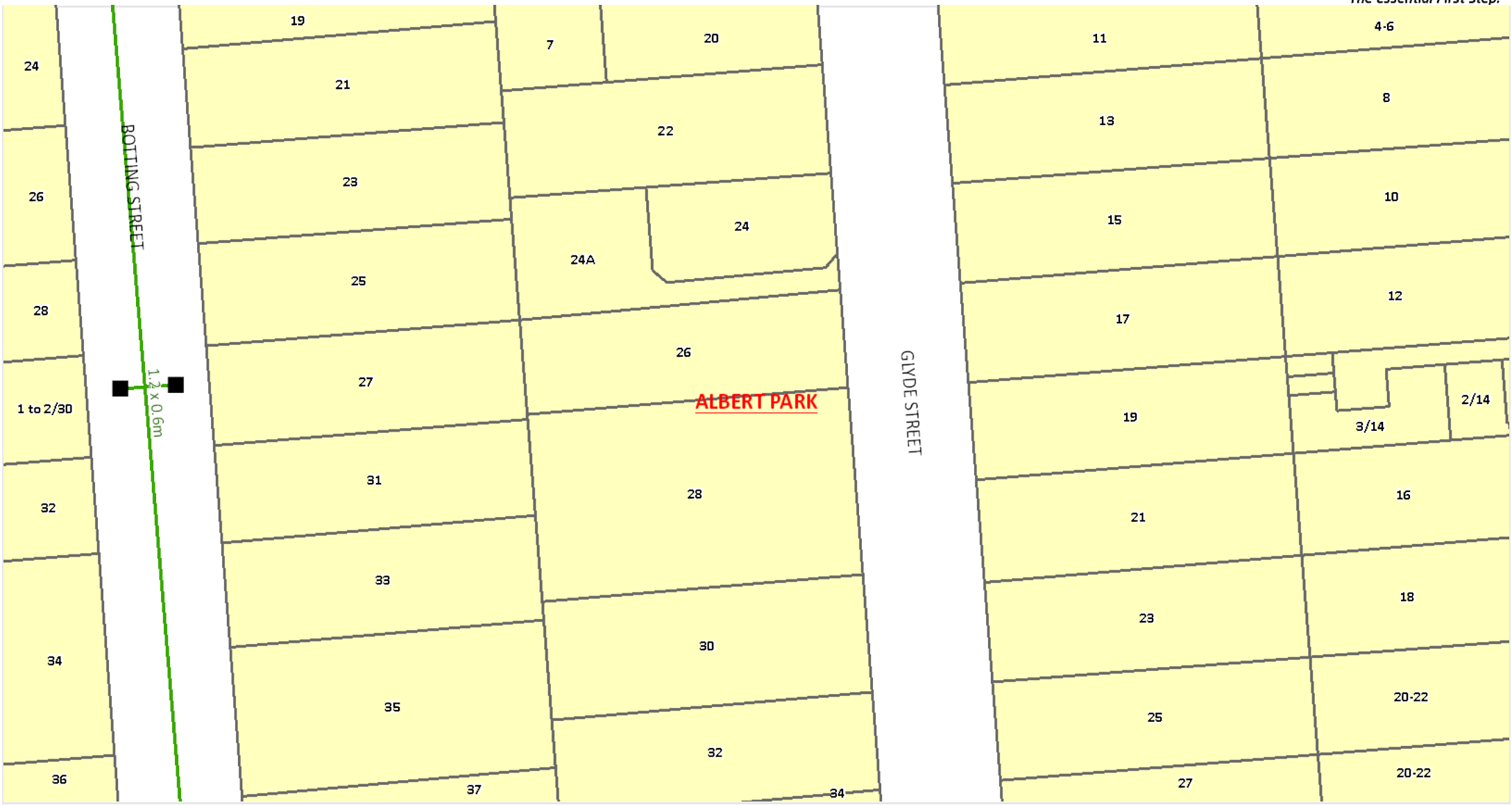


Legend | Scale: 1:800 | Tile No: 5

City of Charles Sturt

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
- Gross Pollutant Trap
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- Communications & Electrical
- Cadastre
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N

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**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

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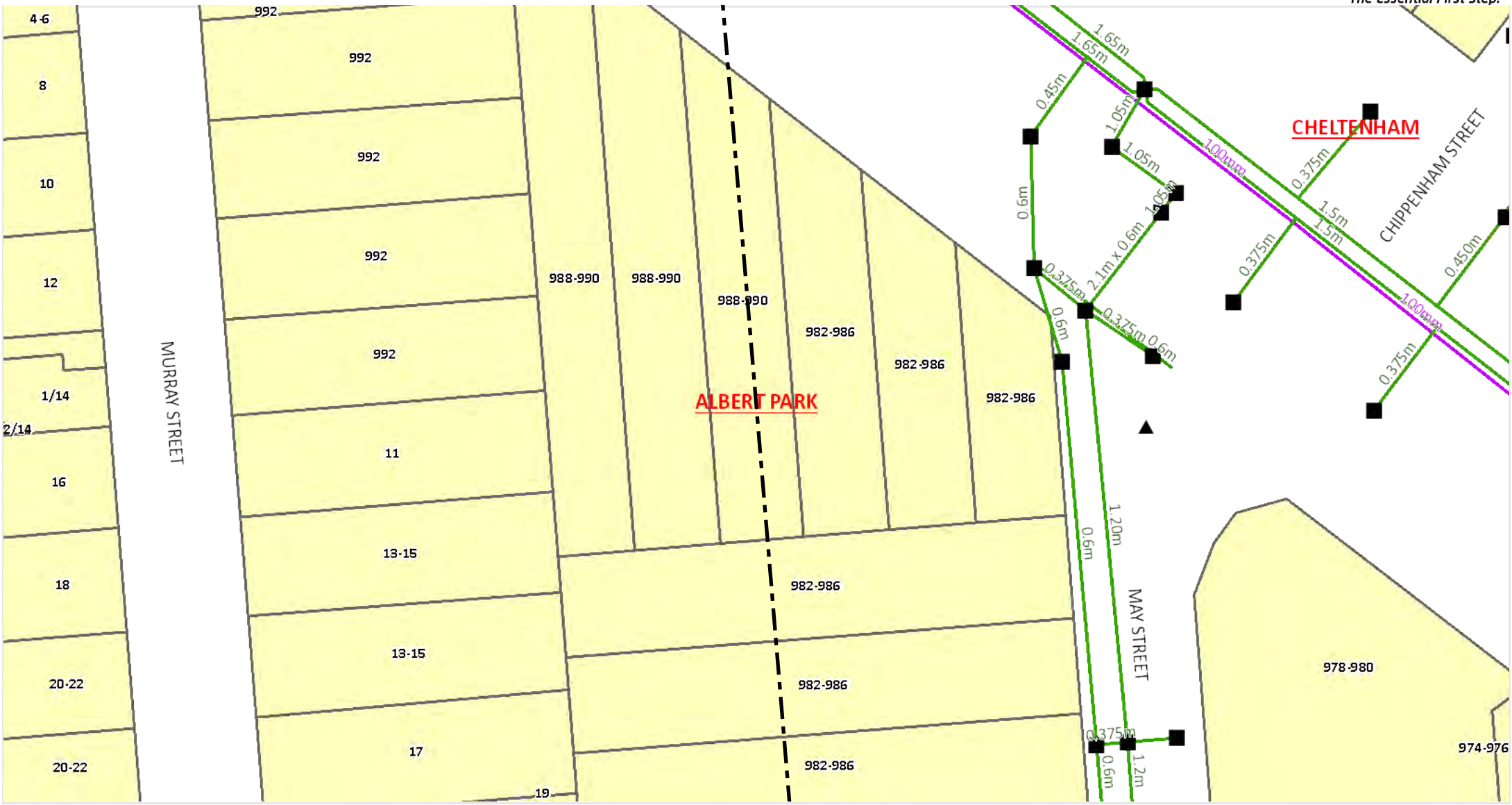


Legend | Scale: 1:800 | Tile No: 6

City of Charles Sturt

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
- Gross Pollutant Trap
- Valve
- Water Meter
- RW Supply Main
- RW Supply Connection
- Communications & Electrical
- Cadastre
- Council Boundary
- State Council Boundaries

N

**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

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Legend | Scale: 1:800 | Tile No: 7

City of Charles Sturt

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
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- Valve
- Water Meter
- RW Supply Main
- RW Supply Connection
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- Cadastre
- Council Boundary
- State Council Boundaries

N

**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

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Legend | Scale: 1:800 | Tile No: 8

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
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N

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**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

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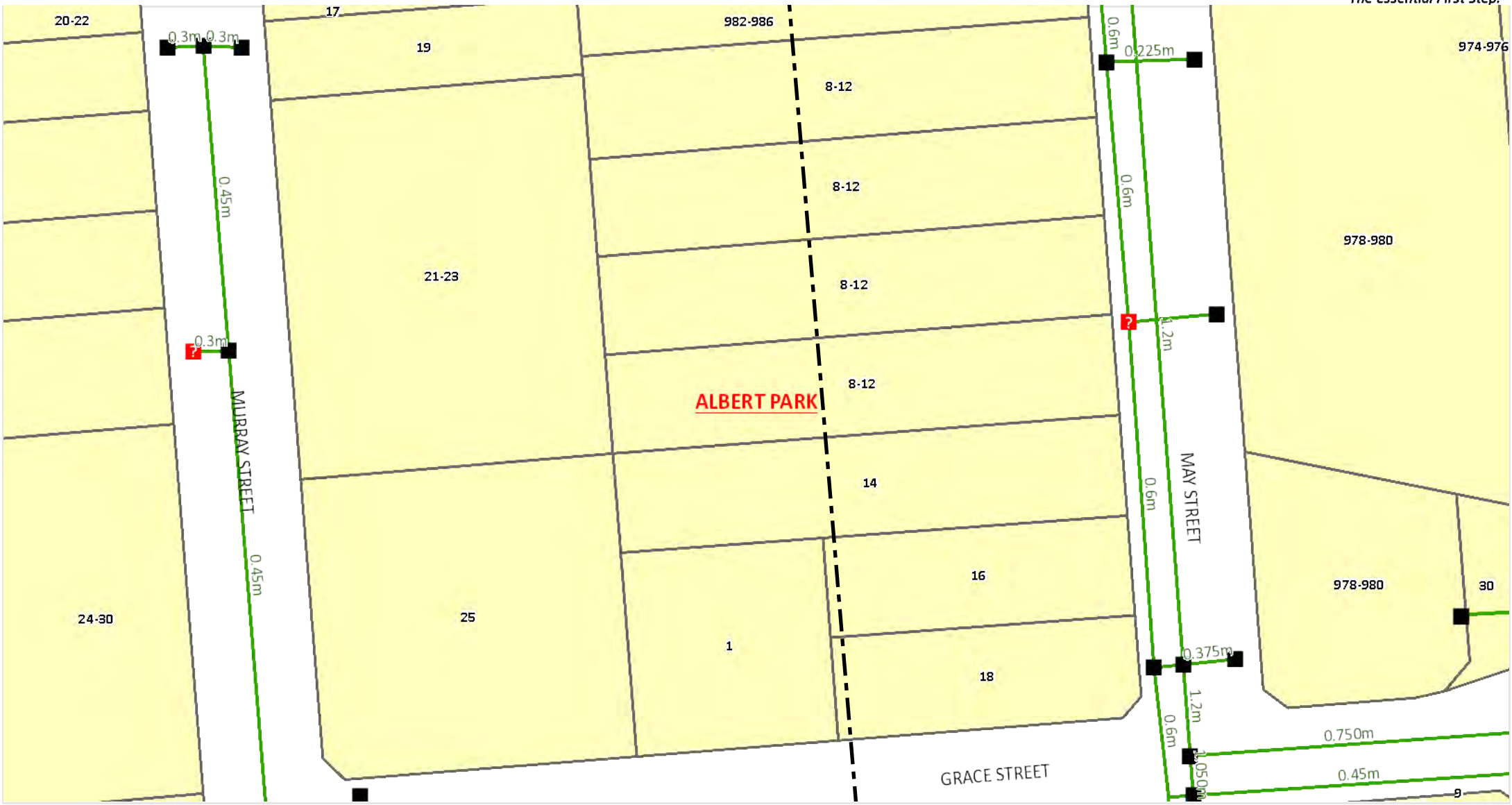
*The Essential First Step.*




Legend | Scale: 1:800 | Tile No: 9

City of Charles Sturt

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
- Gross Pollutant Trap
- Valve
- Water Meter
- RW Supply Main
- RW Supply Connection
- Communications & Electrical
- Cadastre
- Council Boundary
- State Council Boundaries

N

**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

DIAL BEFORE YOU DIG www.1100.com.au
The Essential First Step.


Legend | Scale: 1:800 | Tile No: 10

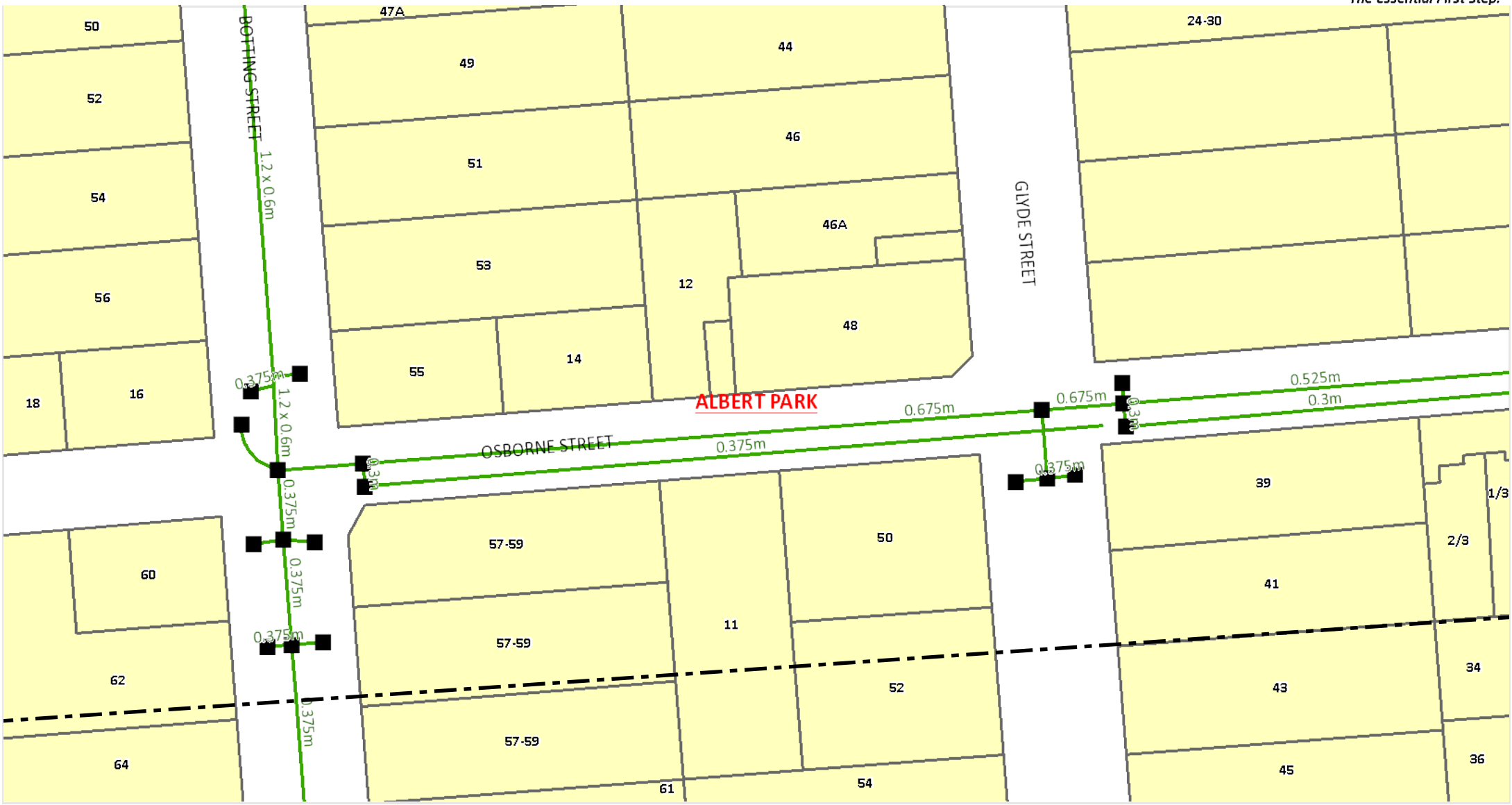
City of Charles Sturt

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
- Gross Pollutant Trap
- Valve
- Water Meter
- RW Supply Main
- RW Supply Connection
- Communications & Electrical
- Cadastre
- Council Boundary
- State Council Boundaries

N

**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

DIAL BEFORE YOU DIG www.1100.com.au
*The Essential First Step.*




Legend | Scale: 1:800 | Tile No: 11

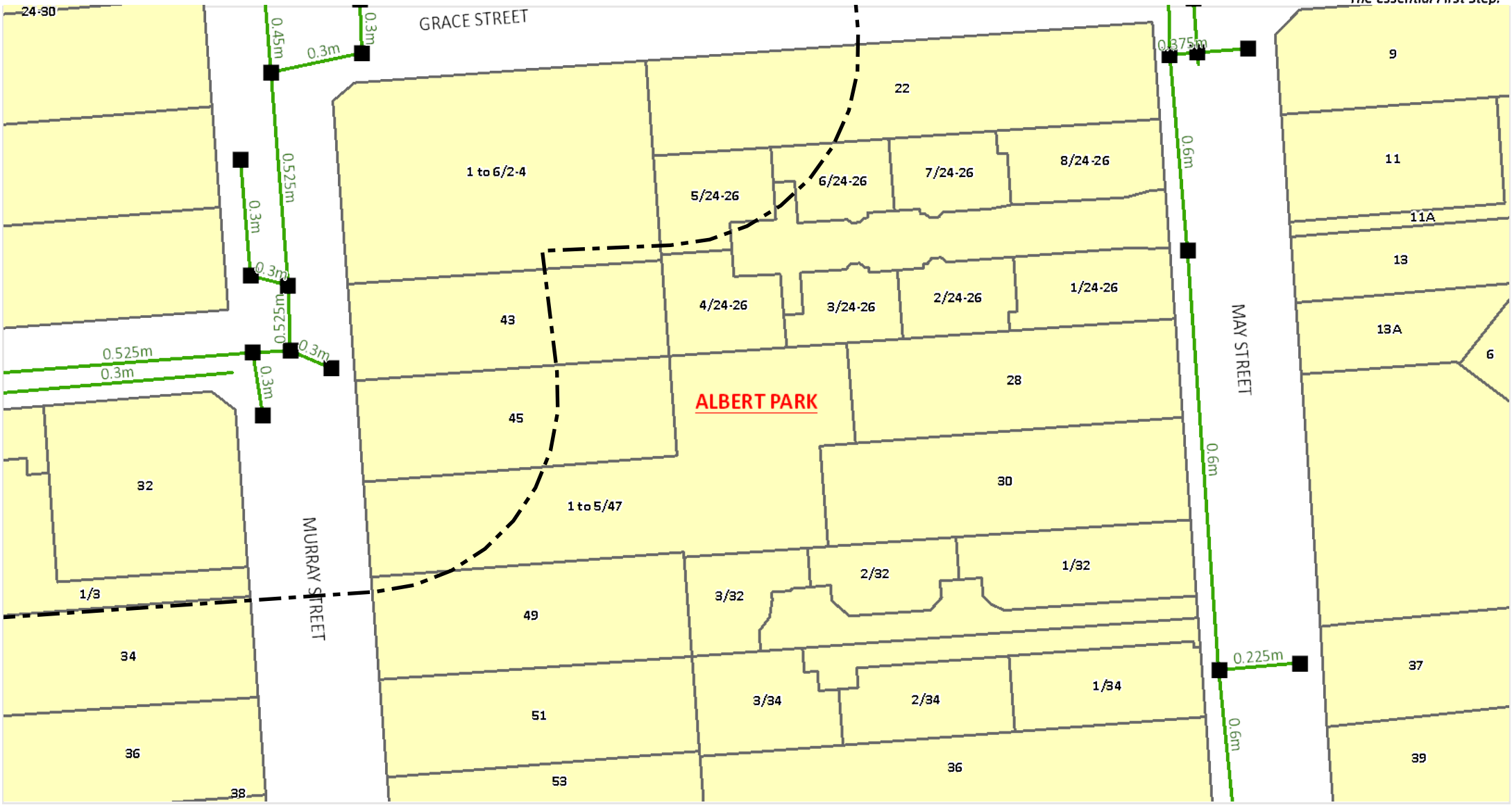
City of Charles Sturt

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
- Gross Pollutant Trap
- Valve
- Water Meter
- RW Supply Main
- RW Supply Connection
- Communications & Electrical
- Cadastre
- Council Boundary
- State Council Boundaries

N

**Sequence No:** 90041688
**Job No:** 18284549
**Location:** Port Road, Woodville Park, SA 5011

DIAL BEFORE YOU DIG www.1100.com.au
The Essential First Step.

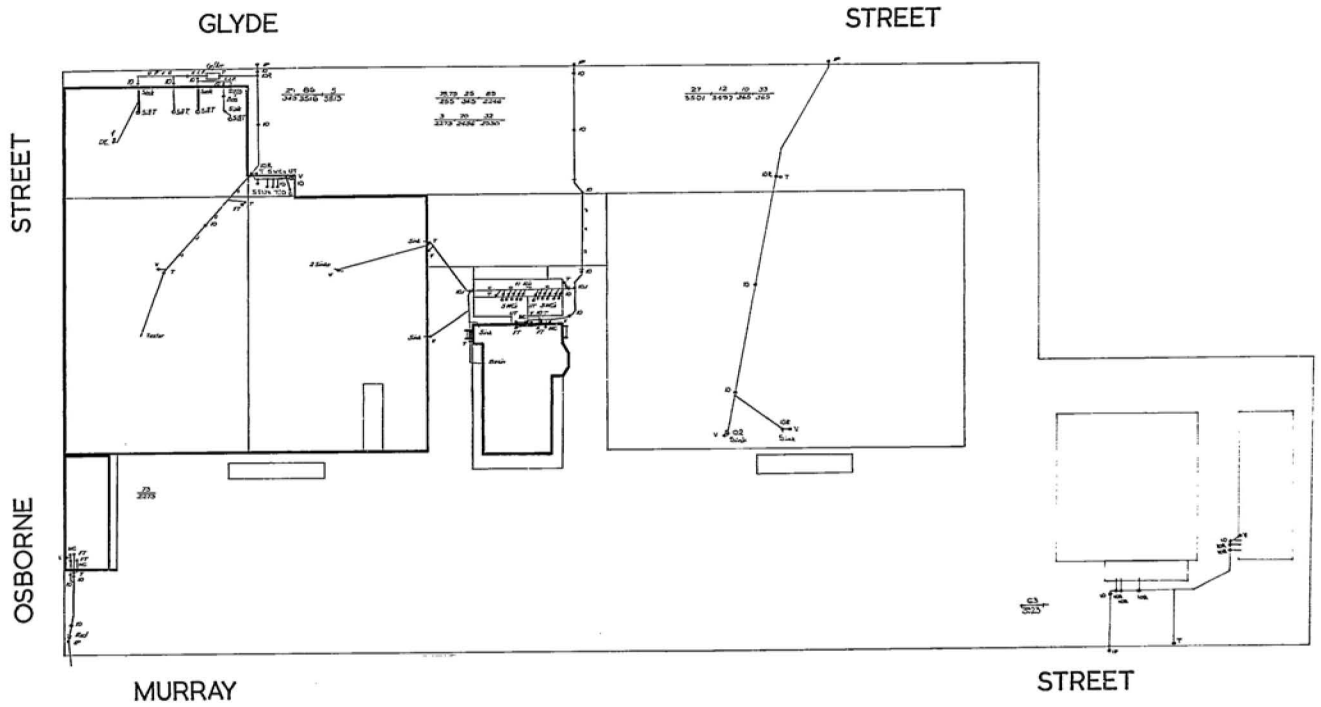



Legend | Scale: 1:800 | Tile No: 12

City of Charles Sturt

- DBYD Enquiry Area
- Stormwater Pits
- Unconfirmed Pits
- Stormwater Drains
- Gross Pollutant Trap
- Valve
- Water Meter
- RW Supply Main
- RW Supply Connection
- Communications & Electrical
- Cadastre
- Council Boundary
- State Council Boundaries

N


GLYDE
STREET
STREET
OSBORNE
MURRAY
STREET

**APPENDIX E**

# Soil Vapour Field Sampling Records

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV01_D** |
| **Client:** | EPA | **Bore Depth:** | 2 |
| **Site Location:** | Albert Park | **Date:** | 4/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 17 |
| Barometric Pressure (kPa) | 1022 |
| Relative Humidity (%) | 53 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 36 |
| Purge Volume (mL) | 135 |
| Purge time @50mL/min (mins) | 3 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 505 |
| Canister Number | 2462 |
| Date Cleaned | 15/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 11:59 | 130,000 | -29 |
| | 12:04 | 50,000 | -22 |
| | 12:09 | 45,000 | -15 |
| | | | |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 12:14 | 40,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131233 | **Gas Bore ID:** | **SV01_S (previously SV01)** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 4/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 17 |
| Barometric Pressure (kPa) | 1022 |
| Relative Humidity (%) | 53 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 616 |
| Canister Number | 3299 |
| Date Cleaned | 15/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 11:27 | 90,000 | -29 |
| | 11:32 | 80,000 | -21 |
| | 11:37 | 75,000 | -15 |
| | 11:42 | 70,000 | -9 |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 11:44 | 65,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV02** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 4/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 17 |
| Barometric Pressure (kPa) | 1022 |
| Relative Humidity (%) | 53 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 402 |
| Canister Number | 2259 |
| Date Cleaned | 3/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 12:33 | 30,000 | -29 |
| | 12:38 | 25,000 | -20 |
| | 12:43 | 30,000 | -15 |
| | | | |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 12:47 | 20,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV03_D** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 4/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 17 |
| Barometric Pressure (kPa) | 1022 |
| Relative Humidity (%) | 53 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 822 |
| Canister Number | 1872 |
| Date Cleaned | 21/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 13:46 | 25,000 | -28 |
| | 13:51 | 15,000 | -20 |
| | 13:56 | 15,000 | -13 |
| | | | |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 14:01 | 15,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV03_S** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 4/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 17 |
| Barometric Pressure (kPa) | 1022 |
| Relative Humidity (%) | 53 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 817 |
| Canister Number | 3655 |
| Date Cleaned | 21/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 14:07 | 80,000 | -28 |
| | 14:12 | 50,000 | -20 |
| | 14:17 | 50,000 | -15 |
| | 14:22 | 50,000 | -10 |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 14:29 | 50,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV06** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 4/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 17 |
| Barometric Pressure (kPa) | 1022 |
| Relative Humidity (%) | 53 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 830 |
| Canister Number | 1697 |
| Date Cleaned | 16/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 13:05 | 50,000 | -30 |
| | 13:10 | 50,000 | -25 |
| | 13:15 | 40,000 | -19 |
| | 13:20 | 40,000 | -15 |
| | 13:25 | 40,000 | -10 |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 13:27 | 30,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV11** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 4/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 17 |
| Barometric Pressure (kPa) | 1022 |
| Relative Humidity (%) | 53 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 399 |
| Canister Number | 2460 |
| Date Cleaned | 21/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 15:53 | 150,000 | -29 |
| | 15:58 | 110,000 | -20 |
| | 16:03 | 50,000 | -13 |
| | 16:08 | 50,000 | -9 |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 16:11 | 40,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV12** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 4/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 17 |
| Barometric Pressure (kPa) | 1022 |
| Relative Humidity (%) | 53 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 833 |
| Canister Number | 3644 |
| Date Cleaned | 15/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 16:18 | 200,000 | -30 |
| | 16:23 | 150,000 | -25 |
| | 16:28 | 100,000 | -18 |
| | 16:33 | 85 | -12 |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 16:36 | 75000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV13** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 5/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 15 |
| Barometric Pressure (kPa) | 1024 |
| Relative Humidity (%) | 60 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 836 |
| Canister Number | 3510 |
| Date Cleaned | 13/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 8:30 | 80,000 | -29 |
| | 8:35 | 45,000 | -21 |
| | 8:40 | 25,000 | -14 |
| | | | |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 8:45 | 50,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV13-R1** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 5/11/19 |
| **Sample Type** | Replicate | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 15 |
| Barometric Pressure (kPa) | 1024 |
| Relative Humidity (%) | 60 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 836 |
| Canister Number | 1699 |
| Date Cleaned | 14/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 8:45 | 50,000 | -29 |
| | 8:50 | 50,000 | -24 |
| | 8:55 | 45,000 | -18 |
| | 9:00 | 45,000 | -13 |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 9:03 | 30,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV13-R2** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 5/11/19 |
| **Sample Type** | Replicate | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 15 |
| Barometric Pressure (kPa) | 1024 |
| Relative Humidity (%) | 60 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 836 |
| Canister Number | 873 (ALS) |
| Date Cleaned | - |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 9:03 | 50,000 | -29 |
| | 9:08 | 20,000 | -25 |
| | 9:13 | 10,000 | -19 |
| | 9:18 | 95,000 | -14 |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 9:24 | 70,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV14** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 5/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

**Information recorded on site**

| | |
|---|---|
| Ambient Temperature | 17 |
| Barometric Pressure (kPa) | 1022 |
| Relative Humidity (%) | 53 |
| Rain | Dry |
| Water Logged | No |

**Purging Information (Calculated)**

| | |
|---|---|
| Sample train Volume (mL) | 9 |
| Bore Volume (mL) | 18 |
| Purge Volume (mL) | 81 |
| Purge time @50mL/min (mins) | 2 |

**Pre Sample Checklist**

| | |
|---|---|
| Clean Sampling Line | Yes |
| Leak Check (Helium) | Yes |
| Purged Bore Line | Yes |

## EQUIPMENT RECORD

| | ID | Calibration Date |
|---|---|---|
| Purge Pump | PID | |
| Rotameter | - | |
| Helium Dectector | Multi-Gas 041930 | |

| | |
|---|---|
| Flow Controller | 627 |
| Canister Number | 2289 |
| Date Cleaned | 25/10/2019 |

## SAMPLING RECORD

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| **Start** | 10:20 | 65,000 | -30 |
| | 10:25 | 55,000 | -23 |
| | 10:30 | 50,000 | -17 |
| | 10:35 | 50,000 | -11 |
| | | | |
| | | | |
| | | | |

| | Time | Helium (ppm) | Vacuum (Hg) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 10:38 | 45,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV15** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 5/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

| **Information recorded on site** | | **Purging Information (Calculated)** | | **Pre Sample Checklist** | |
|---|---|---|---|---|---|
| Ambient Temperature | 17 | Sample train Volume (mL) | 9 | Clean Sampling Line | Yes |
| Barometric Pressure (kPa) | 1022 | Bore Volume (mL) | 18 | Leak Check (Helium) | Yes |
| Relative Humidity (%) | 53 | Purge Volume (mL) | 81 | Purged Bore Line | Yes |
| Rain | Dry | Purge time @50mL/min (mins) | 2 | | |
| Water Logged | No | | | | |

## EQUIPMENT RECORD

| | **ID** | **Calibration Date** | | |
|---|---|---|---|---|
| Purge Pump | PID | | Flow Controller | 1899 |
| Rotameter | - | | Canister Number | 2284 |
| Helium Dectector | Multi-Gas 041930 | | Date Cleaned | 15/10/2019 |

## SAMPLING RECORD

| | **Time** | **Helium (ppm)** | **Vacuum (Hg)** | | **Time** | **Helium (ppm)** | **Vacuum (Hg)** |
|---|---|---|---|---|---|---|---|
| **Start** | 10:52 | 80,000 | -28 | | | | |
| | 10:57 | 70,000 | -19 | | | | |
| | 11:02 | 65,000 | -12 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | **Finish** | 11:06 | 60,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV16** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 5/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

| **Information recorded on site** | | **Purging Information (Calculated)** | | **Pre Sample Checklist** | |
|---|---|---|---|---|---|
| Ambient Temperature | 17 | Sample train Volume (mL) | 9 | Clean Sampling Line | Yes |
| Barometric Pressure (kPa) | 1022 | Bore Volume (mL) | 18 | Leak Check (Helium) | Yes |
| Relative Humidity (%) | 53 | Purge Volume (mL) | 81 | Purged Bore Line | Yes |
| Rain | Dry | Purge time @50mL/min (mins) | 2 | | |
| Water Logged | No | | | | |

## EQUIPMENT RECORD

| | **ID** | **Calibration Date** | | |
|---|---|---|---|---|
| Purge Pump | PID | | Flow Controller | 2082 |
| Rotameter | - | | Canister Number | 2273 |
| Helium Dectector | Multi-Gas 041930 | | Date Cleaned | 15/10/2019 |

## SAMPLING RECORD

| | **Time** | **Helium (ppm)** | **Vacuum (Hg)** |
|---|---|---|---|
| **Start** | 11:24 | 50,000 | -28 |
| | 11:29 | 45,000 | -20 |
| | 11:34 | 45,000 | -12 |
| | | | |
| | | | |
| | | | |
| | | | |

| | **Time** | **Helium (ppm)** | **Vacuum (Hg)** |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 11:39 | 40,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV17** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 5/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

| **Information recorded on site** | | **Purging Information (Calculated)** | | **Pre Sample Checklist** | |
|---|---|---|---|---|---|
| Ambient Temperature | 17 | Sample train Volume (mL) | 9 | Clean Sampling Line | Yes |
| Barometric Pressure (kPa) | 1022 | Bore Volume (mL) | 18 | Leak Check (Helium) | Yes |
| Relative Humidity (%) | 53 | Purge Volume (mL) | 81 | Purged Bore Line | Yes |
| Rain | Dry | Purge time @50mL/min (mins) | 2 | | |
| Water Logged | No | | | | |

## EQUIPMENT RECORD

| | **ID** | **Calibration Date** | | |
|---|---|---|---|---|
| Purge Pump | PID | | Flow Controller | 831 |
| Rotameter | - | | Canister Number | 2467 |
| Helium Dectector | Multi-Gas 041930 | | Date Cleaned | 21/10/2019 |

## SAMPLING RECORD

| | **Time** | **Helium (ppm)** | **Vacuum (Hg)** |
|---|---|---|---|
| **Start** | 12:40 | 40,000 | -28 |
| | 12:45 | 20,000 | -22 |
| | 12:50 | 10,000 | -15 |
| | | | |
| | | | |
| | | | |
| | | | |

| | **Time** | **Helium (ppm)** | **Vacuum (Hg)** |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Finish** | 12:54 | 10,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV18** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 5/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

| **Information recorded on site** | | **Purging Information (Calculated)** | | **Pre Sample Checklist** | |
|---|---|---|---|---|---|
| Ambient Temperature | 17 | Sample train Volume (mL) | 9 | Clean Sampling Line | Yes |
| Barometric Pressure (kPa) | 1022 | Bore Volume (mL) | 18 | Leak Check (Helium) | Yes |
| Relative Humidity (%) | 53 | Purge Volume (mL) | 81 | Purged Bore Line | Yes |
| Rain | Dry | Purge time @50mL/min (mins) | 2 | | |
| Water Logged | No | | | | |

## EQUIPMENT RECORD

| | **ID** | **Calibration Date** | | |
|---|---|---|---|---|
| Purge Pump | PID | | Flow Controller | 1565 |
| Rotameter | - | | Canister Number | 2283 |
| Helium Dectector | Multi-Gas 041930 | | Date Cleaned | 15/10/2019 |

## SAMPLING RECORD

| | **Time** | **Helium (ppm)** | **Vacuum (Hg)** | | **Time** | **Helium (ppm)** | **Vacuum (Hg)** |
|---|---|---|---|---|---|---|---|
| **Start** | 12:15 | 70,000 | -29 | | | | |
| | 12:20 | 65,000 | -22 | | | | |
| | 12:25 | 50,000 | -14 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | **Finish** | 12:31 | 50,000 | -7 |

## NOTES

# SOIL GAS SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131333 | **Gas Bore ID:** | **SV19** |
| **Client:** | EPA | **Bore Depth:** | 1 |
| **Site Location:** | Albert Park | **Date:** | 5/11/19 |
| **Sample Type** | Primary | **Sampled By:** | JI |

## GAS BORE DATA

| **Information recorded on site** | | **Purging Information (Calculated)** | | **Pre Sample Checklist** | |
|---|---|---|---|---|---|
| Ambient Temperature | 17 | Sample train Volume (mL) | 9 | Clean Sampling Line | Yes |
| Barometric Pressure (kPa) | 1022 | Bore Volume (mL) | 18 | Leak Check (Helium) | Yes |
| Relative Humidity (%) | 53 | Purge Volume (mL) | 81 | Purged Bore Line | Yes |
| Rain | Dry | Purge time @50mL/min (mins) | 2 | | |
| Water Logged | No | | | | |

## EQUIPMENT RECORD

| | **ID** | **Calibration Date** | | |
|---|---|---|---|---|
| Purge Pump | PID | | Flow Controller | 626 |
| Rotameter | - | | Canister Number | 3639 |
| Helium Dectector | Multi-Gas 041930 | | Date Cleaned | 13/10/2019 |

## SAMPLING RECORD

| | **Time** | **Helium (ppm)** | **Vacuum (Hg)** | | **Time** | **Helium (ppm)** | **Vacuum (Hg)** |
|---|---|---|---|---|---|---|---|
| **Start** | 9:38 | 70,000 | -29 | | | | |
| | 9:43 | 65,000 | -24 | | | | |
| | 9:48 | 35,000 | -17 | | | | |
| | 9:53 | 35,000 | -11 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | **Finish** | 9:57 | 20,000 | -7 |

## NOTES

**APPENDIX F**

# Groundwater Field Sampling Records

# GROUNDWATER SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131233 | **WELL ID** | **GW01** |
| **Client:** | EPA | **Date:** | 21/11/2019 |
| **Site Location:** | Albert Park | **Sampled By:** | JI |

## GROUNDWATER WELL DATA

**Information recorded on site**

| | |
|---|---|
| Diameter of standpipe (mm) | 50 |
| Standpipe stick up (m) | -0.1 |
| Time | 1:05 |
| Interface probe used? | Yes |
| Depth to product (mbRP)* | - |
| Depth to water (mbRP) | 3.852 |
| Thickness of product (interface probe) (m) | - |
| Total depth of well (mbRP) | 5.32 |
| Bailed Thickness (m) | - |

**Information from file**

| | |
|---|---|
| Surveyed reference point | TOC |
| Depth of well (from log) | 5.5 |
| Depth of pump intake (mbRP) | 5 |
| Length of hose (m) | 6.5 |
| Volume in hose (L) | - |

Note: Standard reference point is top of PVC standpipe
mbRP - metres below top of reference point
Hose volume - 0.1 L/m of 12mm internal diameter hose
Hose volume - 0.05 L/m of 8mm internal diameter hose
Hose volume - 0.03 L/m of 6.35mm internal diameter hose

Gatic / Standpipe Condition: Good

## EQUIPMENT RECORD

Purging & Sampling Method: Low Flow — Peristaltic pump
YSI Pro Plus Serial No: 35877

Calibrated by: Kennards
Calibration Date: 20/11/2019

## PURGING RECORD

Depth to water after placement of pump (mbRP): 3.852

| Time | Volume Purged (L) (not cumulative) | Temp (°C) | Dissolved Oxygen (mg/L) | Conductivity (uS/cm) | pH | Redox Potential (mV) | Depth to Water (mbRP) | Drawdown (m) | Appearance (colour, turbidity, odour, etc) |
|---|---|---|---|---|---|---|---|---|---|
| | Stabilisation Range | ± 0.5 °C | ± 10% | ± 5% | ± 0.1 | ± 10 mV | | | |
| 1:30 | 1 | 22.6 | 1.36 | 2866 | 7.27 | 143.7 | 3.863 | 0.011 | Clear, medium, none |
| 1:35 | 1 | 22.2 | 1.09 | 2839 | 7.27 | 151.2 | 3.863 | 0.011 | |
| 1:40 | 1 | 22.0 | 0.91 | 2818 | 7.28 | 150.9 | 3.863 | 0.011 | |
| 1:45 | 1 | 22.0 | 0.83 | 2816 | 7.28 | 148.5 | 3.863 | 0.011 | |
| 1:50 | 1 | 22.0 | 0.82 | 2813 | 7.29 | 147 | 3.863 | 0.011 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| **Calculated Stabilisation Range** | | **0.1** | **5.2** | **0.1** | **0.01** | **3.9** | **Drawdown (m)** | 0.011 | |

| | |
|---|---|
| **Total vol. purged (L)** | 5 |
| **Purged vol. (from well) (L)** | 0.0869 |
| **Flow Rate (L/min)** | **0.2** |

| Bladder Pump Adjustments | | |
|---|---|---|
| **Discharge** | **Refill** | **CPM** |
| | | - |

## SAMPLING RECORD

| | | | | | |
|---|---|---|---|---|---|
| Time sampled: | 1:55 | Sample ID: | GW01 | | |
| Colour: | Clear | Duplicate Taken: | No | Duplicate ID: | |
| Odour: | No | Rinsate Taken: | No | Rinsate ID: | |
| Turbidity: | Low to Medium | Field Blank Taken: | No | Field Blank ID: | |
| Hydrocarbon sheen/LNAPL?: | No | | | | |

**Sample Container and Preservation:** (F = Filtered, UF = Unfiltered, P = Preserved, UP = Unpreserved)

| | | | | | |
|---|---|---|---|---|---|
| 1 (F) | Metals (F/UF) | 6 | Vials (P) | 1 | Ferrous Iron (F/P) |
| 2 | Green Plastic | 1 | Amber (UP) | | PFAS |
| 1 | Purple Plastic (P) | | Cyanide (P) | | Other |

## OBSERVATIONS

**Weather Conditions:** Temperature: 22 — Precipitation / Wind: Light Rain

**Notes:**

# GROUNDWATER SAMPLING RECORD FORM

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131233 | **WELL ID** | **GW02** |
| **Client:** | EPA | **Date:** | 21/11/2019 |
| **Site Location:** | Albert Park | **Sampled By:** | JI |

## GROUNDWATER WELL DATA

**Information recorded on site**

| | |
|---|---|
| Diameter of standpipe (mm) | 50 |
| Standpipe stick up (m) | -0.1 |
| Time | 11:45 |
| Interface probe used? | Yes |
| Depth to product (mbRP)* | - |
| Depth to water (mbRP) | 3.517 |
| Thickness of product (interface probe) (m) | - |
| Total depth of well (mbRP) | 5 |
| Bailed Thickness (m) | - |

**Information from file**

| | |
|---|---|
| Surveyed reference point | TOC |
| Depth of well (from log) | 5 |
| Depth of pump intake (mbRP) | 4.5 |
| Length of hose (m) | 6 |
| Volume in hose (L) | - |

Note: Standard reference point is top of PVC standpipe
mbRP - metres below top of reference point
Hose volume - 0.1 L/m of 12mm internal diameter hose
Hose volume - 0.05 L/m of 8mm internal diameter hose
Hose volume - 0.03 L/m of 6.35mm internal diameter hose

Gatic / Standpipe Condition: Good

## EQUIPMENT RECORD

Purging & Sampling Method: Low Flow — Peristaltic pump
YSI Pro Plus Serial No: 35877
Calibrated by: Kennards
Calibration Date: 20/11/2019

## PURGING RECORD

Depth to water after placement of pump (mbRP): 3.517

| Time | Volume Purged (L) (not cumulative) | Temp (°C) | Dissolved Oxygen (mg/L) | Conductivity (uS/cm) | pH | Redox Potential (mV) | Depth to Water (mbRP) | Drawdown (m) | Appearance (colour, turbidity, odour, etc) |
|---|---|---|---|---|---|---|---|---|---|
| | Stabilisation Range | ± 0.5 °C | ± 10% | ± 5% | ± 0.1 | ± 10 mV | | | |
| 11:50 | 1 | 22.8 | 2.50 | 5497 | 7.41 | 98.9 | 3.540 | 0.023 | Clear, medium, none |
| 11:55 | 1 | 22.3 | 2.61 | 5405 | 7.40 | 100.6 | 3.540 | 0.023 | |
| 12:00 | 1 | 22.0 | 2.03 | 5437 | 7.39 | 102.1 | 3.540 | 0.023 | |
| 12:05 | 1 | 22.2 | 1.81 | 5465 | 7.38 | 103.6 | 3.540 | 0.023 | |
| 12::10 | 1 | 22.1 | 1.78 | 5465 | 7.38 | 103.8 | 3.540 | 0.023 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| **Calculated Stabilisation Range** | | **0.2** | **6.6** | **0.3** | **0.01** | **1.7** | **Drawdown (m)** | 0.023 | |

| | |
|---|---|
| **Total vol. purged (L)** | 5 |
| **Purged vol. (from well) (L)** | 0.1817 |
| **Flow Rate (L/min)** | **0.2** |

| Bladder Pump Adjustments | | |
|---|---|---|
| **Discharge** | **Refill** | **CPM** |
| | | - |

## SAMPLING RECORD

| | | | | | |
|---|---|---|---|---|---|
| Time sampled: | 12:15 | Sample ID: | GW02 | | |
| Colour: | Clear | Duplicate Taken: | Yes | Duplicate ID: | DUP1A, DUP1B |
| Odour: | No | Rinsate Taken: | No | Rinsate ID: | |
| Turbidity: | Low to Medium | Field Blank Taken: | No | Field Blank ID: | |
| Hydrocarbon sheen/LNAPL?: | No | | | | |

**Sample Container and Preservation:** (F = Filtered, UF = Unfiltered, P = Preserved, UP = Unpreserved)

| | | | | | |
|---|---|---|---|---|---|
| 1 (F) | Metals (F/UF) | 6 | Vials (P) | 1 | Ferrous Iron (F/P) |
| 2 | Green Plastic | 1 | Amber (UP) | | PFAS |
| 1 | Purple Plastic (P) | | Cyanide (P) | | Other |

## OBSERVATIONS

**Weather Conditions:** Temperature: 22 — Precipitation / Wind: Light Rain
**Notes:**

# GROUNDWATER SAMPLING RECORD FORM

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131233 | **WELL ID** | **GW03** |
| **Client:** | EPA | **Date:** | 21/11/2019 |
| **Site Location:** | Albert Park | **Sampled By:** | JI |

## GROUNDWATER WELL DATA

**Information recorded on site**

| | |
|---|---|
| Diameter of standpipe (mm) | 50 |
| Standpipe stick up (m) | -0.1 |
| Time | 9:00 |
| Interface probe used? | Yes |
| Depth to product (mbRP)* | - |
| Depth to water (mbRP) | 3.357 |
| Thickness of product (interface probe) (m) | - |
| Total depth of well (mbRP) | 5.30 |
| Bailed Thickness (m) | - |

**Information from file**

| | |
|---|---|
| Surveyed reference point | TOC |
| Depth of well (from log) | 5 |
| Depth of pump intake (mbRP) | 4.5 |
| Length of hose (m) | 6 |
| Volume in hose (L) | - |

Note: Standard reference point is top of PVC standpipe
mbRP - metres below top of reference point
Hose volume - 0.1 L/m of 12mm internal diameter hose
Hose volume - 0.05 L/m of 8mm internal diameter hose
Hose volume - 0.03 L/m of 6.35mm internal diameter hose

Gatic / Standpipe Condition: Good

## EQUIPMENT RECORD

Purging & Sampling Method: Low Flow — Peristaltic pump
YSI Pro Plus Serial No: 35877

Calibrated by: Kennards
Calibration Date: 20/11/2019

## PURGING RECORD

Depth to water after placement of pump (mbRP): 3.357

| Time | Volume Purged (L) (not cumulative) | Temp (°C) | Dissolved Oxygen (mg/L) | Conductivity (uS/cm) | pH | Redox Potential (mV) | Depth to Water (mbRP) | Drawdown (m) | Appearance (colour, turbidity, odour, etc) |
|---|---|---|---|---|---|---|---|---|---|
| | Stabilisation Range | ± 0.5 °C | ± 10% | ± 5% | ± 0.1 | ± 10 mV | | | |
| 9:15 | 1 | 19.9 | 0.53 | 8350 | 7.22 | 6.8 | 3.365 | 0.008 | Clear, low, none |
| 9:20 | 1 | 19.5 | 0.44 | 9190 | 7.26 | 12.2 | 3.373 | 0.016 | |
| 9:25 | 1 | 19.3 | 0.44 | 9066 | 7.27 | 18.8 | 3.373 | 0.016 | |
| 9:30 | 1 | 19.3 | 0.41 | 9059 | 7.28 | 22.3 | 3.373 | 0.016 | |
| 9:35 | 1 | 19.3 | 0.43 | 9036 | 7.28 | 25.8 | 3.373 | 0.016 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| **Calculated Stabilisation Range** | | **0.1** | **3.5** | **0.2** | **0.01** | **7.0** | **Drawdown (m)** | 0.016 | |

| | |
|---|---|
| **Total vol. purged (L)** | 5 |
| **Purged vol. (from well) (L)** | 0.1264 |
| **Flow Rate (L/min)** | **0.2** |

| Bladder Pump Adjustments | | |
|---|---|---|
| **Discharge** | **Refill** | **CPM** |
| | | - |

## SAMPLING RECORD

| | | | | | |
|---|---|---|---|---|---|
| Time sampled: | 9:40 | Sample ID: | GW03 | | |
| Colour: | Clear | Duplicate Taken: | No | Duplicate ID: | |
| Odour: | No | Rinsate Taken: | No | Rinsate ID: | |
| Turbidity: | Low | Field Blank Taken: | No | Field Blank ID: | |
| Hydrocarbon sheen/LNAPL?: | No | | | | |

**Sample Container and Preservation:** (F = Filtered, UF = Unfiltered, P = Preserved, UP = Unpreserved)

| | | | | | |
|---|---|---|---|---|---|
| 1 (F) | Metals (F/UF) | 6 | Vials (P) | 1 | Ferrous Iron (F/P) |
| 2 | Green Plastic | 1 | Amber (UP) | | PFAS |
| 1 | Purple Plastic (P) | | Cyanide (P) | | Other |

## OBSERVATIONS

**Weather Conditions:** Temperature: 22 — Precipitation / Wind: Light Rain

**Notes:**

# GROUNDWATER SAMPLING RECORD FORM

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131233 | **WELL ID** | **GW04** |
| **Client:** | EPA | **Date:** | 21/11/2019 |
| **Site Location:** | Albert Park | **Sampled By:** | JI |

## GROUNDWATER WELL DATA

**Information recorded on site**

| | |
|---|---|
| Diameter of standpipe (mm) | 50 |
| Standpipe stick up (m) | -0.1 |
| Time | 10:00 |
| Interface probe used? | Yes |
| Depth to product (mbRP)* | - |
| Depth to water (mbRP) | 3.253 |
| Thickness of product (interface probe) (m) | - |
| Total depth of well (mbRP) | 5.15 |
| Bailed Thickness (m) | - |

**Information from file**

| | |
|---|---|
| Surveyed reference point | TOC |
| Depth of well (from log) | 5 |
| Depth of pump intake (mbRP) | 4.5 |
| Length of hose (m) | 6 |
| Volume in hose (L) | - |

Note: Standard reference point is top of PVC standpipe
mbRP - metres below top of reference point
Hose volume - 0.1 L/m of 12mm internal diameter hose
Hose volume - 0.05 L/m of 8mm internal diameter hose
Hose volume - 0.03 L/m of 6.35mm internal diameter hose

Gatic / Standpipe Condition: Good

## EQUIPMENT RECORD

Purging & Sampling Method: Low Flow — Peristaltic pump
YSI Pro Plus Serial No: 35877

Calibrated by: Kennards
Calibration Date: 20/11/2019

## PURGING RECORD

Depth to water after placement of pump (mbRP): 3.253

| Time | Volume Purged (L) (not cumulative) | Temp (°C) | Dissolved Oxygen (mg/L) | Conductivity (uS/cm) | pH | Redox Potential (mV) | Depth to Water (mbRP) | Drawdown (m) | Appearance (colour, turbidity, odour, etc) |
|---|---|---|---|---|---|---|---|---|---|
| | Stabilisation Range | ± 0.5 °C | ± 10% | ± 5% | ± 0.1 | ± 10 mV | | | |
| 10:20 | 1 | 21.3 | 3.34 | 2606 | 7.51 | 50.6 | 3.270 | 0.017 | Clear, medium, none |
| 10:25 | 1 | 21.1 | 2.85 | 2531 | 7.45 | 59.9 | 3.285 | 0.032 | |
| 10:30 | 1 | 21.2 | 2.90 | 2537 | 7.42 | 63.9 | 3.283 | 0.030 | |
| 10:35 | 1 | 21.1 | 2.74 | 2529 | 7.43 | 67 | 3.283 | 0.030 | |
| 10:40 | 1 | 21.1 | 2.64 | 2526 | 7.45 | 69.7 | 3.283 | 0.030 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| **Calculated Stabilisation Range** | | **0.1** | **4.7** | **0.2** | **0.03** | **5.8** | **Drawdown (m)** | 0.032 | |

| | |
|---|---|
| **Total vol. purged (L)** | 5 |
| **Purged vol. (from well) (L)** | 0.2528 |
| **Flow Rate (L/min)** | **0.2** |

| Bladder Pump Adjustments | | |
|---|---|---|
| **Discharge** | **Refill** | **CPM** |
| | | - |

## SAMPLING RECORD

| | | | | | |
|---|---|---|---|---|---|
| Time sampled: | 10:45 | Sample ID: | GW04 | | |
| Colour: | Clear | Duplicate Taken: | No | Duplicate ID: | |
| Odour: | No | Rinsate Taken: | No | Rinsate ID: | |
| Turbidity: | Low to Medium | Field Blank Taken: | No | Field Blank ID: | |
| Hydrocarbon sheen/LNAPL?: | No | | | | |

**Sample Container and Preservation:** (F = Filtered, UF = Unfiltered, P = Preserved, UP = Unpreserved)

| | | | | | |
|---|---|---|---|---|---|
| 1 (F) | Metals (F/UF) | 6 | Vials (P) | 1 | Ferrous Iron (F/P) |
| 2 | Green Plastic | 1 | Amber (UP) | | PFAS |
| 1 | Purple Plastic (P) | | Cyanide (P) | | Other |

## OBSERVATIONS

**Weather Conditions:** Temperature: 22 — Precipitation / Wind: Light Rain

**Notes:**

# GROUNDWATER SAMPLING RECORD FORM

GOLDER

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **Project Number:** | 19131233 | **WELL ID** | **GW05** |
| **Client:** | EPA | **Date:** | 21/11/2019 |
| **Site Location:** | Albert Park | **Sampled By:** | JI |

## GROUNDWATER WELL DATA

**Information recorded on site**

| | |
|---|---|
| Diameter of standpipe (mm) | 50 |
| Standpipe stick up (m) | -0.1 |
| Time | 10:50 |
| Interface probe used? | Yes |
| Depth to product (mbRP)* | - |
| Depth to water (mbRP) | 3.298 |
| Thickness of product (interface probe) (m) | - |
| Total depth of well (mbRP) | 4.95 |
| Bailed Thickness (m) | - |

**Information from file**

| | |
|---|---|
| Surveyed reference point | TOC |
| Depth of well (from log) | 5 |
| Depth of pump intake (mbRP) | 4.5 |
| Length of hose (m) | 6 |
| Volume in hose (L) | - |

Note: Standard reference point is top of PVC standpipe
mbRP - metres below top of reference point
Hose volume - 0.1 L/m of 12mm internal diameter hose
Hose volume - 0.05 L/m of 8mm internal diameter hose
Hose volume - 0.03 L/m of 6.35mm internal diameter hose

Gatic / Standpipe Condition: Good

## EQUIPMENT RECORD

Purging & Sampling Method: Low Flow — Peristaltic pump
YSI Pro Plus Serial No: 35877

Calibrated by: Kennards
Calibration Date: 20/11/2019

## PURGING RECORD

Depth to water after placement of pump (mbRP): 3.298

| Time | Volume Purged (L) (not cumulative) | Temp (°C) | Dissolved Oxygen (mg/L) | Conductivity (uS/cm) | pH | Redox Potential (mV) | Depth to Water (mbRP) | Drawdown (m) | Appearance (colour, turbidity, odour, etc) |
|---|---|---|---|---|---|---|---|---|---|
| | Stabilisation Range | ± 0.5 °C | ± 10% | ± 5% | ± 0.1 | ± 10 mV | | | |
| 11:05 | 1 | 21.6 | 4.87 | 3149 | 7.44 | 82.1 | 3.308 | 0.010 | Clear, medium, none |
| 11:10 | 1 | 21.6 | 4.26 | 3322 | 7.41 | 84.4 | 3.308 | 0.010 | |
| 11:15 | 1 | 22.1 | 3.10 | 3598 | 7.37 | 86.9 | 3.305 | 0.007 | |
| 11:20 | 1 | 22.0 | 2.92 | 3696 | 7.36 | 87.9 | 3.305 | 0.007 | |
| 11:25 | 1 | 21.9 | 2.72 | 3737 | 7.36 | 88.3 | 3.305 | 0.007 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| **Calculated Stabilisation Range** | | **0.1** | **6.5** | **1.9** | **0.01** | **1.4** | **Drawdown (m)** | 0.010 | |

| | |
|---|---|
| **Total vol. purged (L)** | 5 |
| **Purged vol. (from well) (L)** | 0.079 |
| **Flow Rate (L/min)** | **0.2** |

| Bladder Pump Adjustments | | |
|---|---|---|
| **Discharge** | **Refill** | **CPM** |
| | | - |

## SAMPLING RECORD

| | | | | | |
|---|---|---|---|---|---|
| Time sampled: | 11:35 | Sample ID: | GW05 | | |
| Colour: | Clear | Duplicate Taken: | No | Duplicate ID: | |
| Odour: | No | Rinsate Taken: | No | Rinsate ID: | |
| Turbidity: | Low to Medium | Field Blank Taken: | No | Field Blank ID: | |
| Hydrocarbon sheen/LNAPL?: | No | | | | |

**Sample Container and Preservation:** (F = Filtered, UF = Unfiltered, P = Preserved, UP = Unpreserved)

| | | | | | |
|---|---|---|---|---|---|
| 1 (F) | Metals (F/UF) | 6 | Vials (P) | 1 | Ferrous Iron (F/P) |
| 2 | Green Plastic | 1 | Amber (UP) | | PFAS |
| 1 | Purple Plastic (P) | | Cyanide (P) | | Other |

## OBSERVATIONS

**Weather Conditions:** Temperature: 22 — Precipitation / Wind: Light Rain

**Notes:**

**APPENDIX G**

# Field Equipment Calibration Records

*The Safety Company*


| | |
|---|---|
| Date: | 22.OCT.2019 |
| Time: | 12:35 PM |
| Mode: | Calibration |
| Results: | Pass |
| Instrument: | ALT5X |
| User: | |
| Department: | |
| Company: | |
| Serial #: | 118939 |

| | |
|---|---|
| Combustible | - *Pass* |
| Target: 58% LEL* | As Found: 58% LEL* |
| O2 | - *Pass* |
| Target: 15% VOL | As Found: 15.2% VOL |
| CO | - *Pass* |
| Target: 60ppm | As Found: 55ppm |
| H2S | - *Pass* |
| Target: 20ppm | As Found: 19ppm |
| CL2 | - *Pass* |
| Target: 10ppm | As Found: 10ppm |
| VOC | - *Pass* |
| Target: 100ppm | As Found: 111.4ppm |

*% LEL Pentane

SPX DIELECTRIC

# MULTIGAS DETECTOR ATP-735 rev E

## Certificate of Calibration

Name: Supplier returns team.
Company: Arnet Scientific PTY LTD
Customer No.: 05-001203
Phone No. +613-88283300

MGD P/N: 83219 Date: 5-16-19

SN# 041880 Software Rev. 1.13

New _____ Repair X
Work order # 545998 SRA # M219928

| Calibration conditions | | Acceptable Range |
|---|---|---|
| Temperature | 72 | 68-80 F |
| Humidity | 31 | <85% |
| | | |
| Pump Vol. | 1.05 L/min | .90 -1.20 l/min |
| **Calibration point** | **X = Complete** | |
| 0% | X | Set point |
| 2% | X | Set point |
| 50% | X | Set point |
| 100% | X | Set point |
| 25 ppm (final check) | X | 25 – 75 ppm |
| Attachment functionality | X | |
| Other | | |

**Note: All test equipment used in manufacturing and repair is calibrated and traceable. Unless otherwise noted, the accuracy ratios are equal to or greater than 4:1.**
Calibration Procedure used: MGD-2002 Helium Detector Calibration Procedure,
The 2% through 100% tests are performed with pre mixed (grade 5) helium with the remainder being nitrogen. Using a direct Siphon test method.
The 25ppm is performed as a final check as helium permeates a latex membrane.
The units upper reading limit is set at 100% a brief display of +100% is acceptable for a short duration (<10 sec) allowing for sensor stabilization.

Calibration performed by: Luc

RADIODETECTION
28 TOWER ROAD
RAYMOND, MAINE 04071
USA

TEL | 207 | 655 | 8525
TOLL FREE | 877 | 247 | 3797
FAX | 207 | 655 | 8535

rd.sales.us@spx.com

www.radiodetection.com

# EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

## PGN9003827 GAS DETECTOR - PID

**Plant Number:** 234983 SN: 592-914098

| SENSOR | CONCENTRATION | SPAN 1 | SPAN 2 | TRACEABILITY | PASS |
|---|---|---|---|---|---|
| PID Isobutylene | 100ppm | 0 | 100ppm | Lot # 929453 | ☑ |
| | | 0.0 | 100.0 | | |

Data Cleared ☑

| | |
|---|---|
| Battery Status 100 (%) | Temperature ___ °C |
| Electrical Test & Tag (AS/NZS 3760) | Inlet Filter Checked/Changed |

**Note:** Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Dilma Fouché Date: 4/11/19 Signed: _____

**Accessories List:**

| | | |
|---|---|---|
| User's Manual | Charger / Comms Adaptor | Wall Charger |
| 2x Spare Air Filters | 1x Spare Rechargeable Battery | Carry Transit Case |
| | Calibration Report | |
| | | |

# EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

## PGN9003842-9003846 - INTERFACE METER

**Plant Number:** 235270 SN: 268112

**Probe Length:** 60m

| ITEM | TEST | PASS | COMMENTS |
|---|---|---|---|
| Battery | Compartment / Capacity | ☑ 8.8V | 9v |
| Probe | Clean / Operation | ☑ | |
| Earth Lead | Check if equipped | ☑ | |
| Tape Check | Cleaned / Checked for cuts | ☑ | |
| Function test | At surface level | ☑ | |

**Note:** Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

**Checked By:** Wilma Fourie **Date:** 12/11/19 **Signed:**

**Accessories List:**

| | | |
|---|---|---|
| Interface Meter | Tape Guide | Decon 90 Solution |
| Brush | Spare 9v Battery | ~~Instruction Manual~~ |
| Transport Box | | |
| | | |

# EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

## PGN9003827 GAS DETECTOR - PID

**Plant Number:** 235011 SN: 592-912894

| SENSOR | CONCENTRATION | SPAN 1 | SPAN 2 | TRACEABILITY | PASS |
|---|---|---|---|---|---|
| PID Isobutylene | 100ppm | 0 | 100ppm | Lot # | ☑ |
| | | 0,0 | 100,0 | | |

Data Cleared ☑

| | |
|---|---|
| Battery Status 100 (%) | Temperature ____ °C |
| Electrical Test & Tag (AS/NZS 3760) | Inlet Filter Checked/Changed |

**Note:** Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Wilma Fouché Date: 12/11/19 Signed: _____

**Accessories List:**

| | | |
|---|---|---|
| User's Manual | Charger / Comms Adaptor | Wall Charger |
| 2x Spare Air Filters | 1x Spare Rechargeable Battery | Carry Transit Case |
| | Calibration Report | |
| | | |

# EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

## PGN9003871 WATER QUALITY METER – MULTIFUNCTION (SMART TROLL)

**Plant Number:** 235640 SN 532889

| SENSOR | CONCENTRATION | SPAN 1 | SPAN 2 | TRACEABILITY | PASS |
|---|---|---|---|---|---|
| pH | pH 6.88 / pH 4.00 | 6.88 pH | 4.00 pH | ~~325169~~ 325418 | ☑ |
| Conductivity | 12.88 mS/cm | 12.88 mS/cm | | 316592 | ☑ |
| Dissolved Oxygen | Sodium Sulphite / Air | 0.0% in Sodium Sulphite | % Saturation in Air | 10465 | ☑ |
| ORP | 240mV @ 25°C | 240mV | - | 3822 | ☑ |

| | |
|---|---|
| Battery Status 100 % | Temperature 20,8 °C |
| Electrical Test & Tag (AS/NZS 3760) | Electrodes Cleaned and Checked |

**Note:** Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Wilma Fouché Date: 12/11/19 Signed: _____

**Accessories List:**

| | | |
|---|---|---|
| User's Manual & USB | pH Sensor | Conductivity Sensor |
| Dissolved Oxygen Sensor with Wetting Cap | Redox (ORP) Sensor with Wetting Cap | Flow Cell 500ml |
| Charger Adaptor & Comm Cable | Desiccant Satchel | IPod & Transit Case |
| Storage Cap | Testing Cap | Calibration Test Tube |

External Battery

# EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

## PGN9003842-9003846 - INTERFACE METER

**Plant Number:** a35227 SN° 238041

**Probe Length:** 30 m

| ITEM | TEST | PASS | COMMENTS |
|---|---|---|---|
| Battery | Compartment / Capacity | ☑ 8,8 | 9v |
| Probe | Clean / Operation | ☑ | |
| Earth Lead | Check if equipped | ☑ | |
| Tape Check | Cleaned / Checked for cuts | ☑ | |
| Function test | At surface level | ☑ | |

**Note:** Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

**Checked By:** Dilma Foudé **Date:** 20/11/19 **Signed:** _____

**Accessories List:**

| | | |
|---|---|---|
| Interface Meter | Tape Guide | Decon 90 Solution |
| Brush | Spare 9v Battery | ~~Instruction Manual~~ |
| Transport Box | | |
| | | |

# EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

## PGN9003871 WATER QUALITY METER – MULTIFUNCTION (SMART TROLL)

**Plant Number:** 235641 SN: 358177

| SENSOR | CONCENTRATION | SPAN 1 | SPAN 2 | TRACEABILITY | PASS |
|---|---|---|---|---|---|
| pH | pH 7.00 / pH 4.00 | 7.00 pH | 4.00 pH | 325169 / 325418 | ☑ |
| Conductivity | 2.76 mS/cm | 2.76 mS/cm | | 316592 | ☑ |
| Dissolved Oxygen | Sodium Sulphite / Air | 0.0% in Sodium Sulphite | % Saturation in Air | 10465 | ☑ |
| ORP | 240mV @ 25°C | 240mV | - | 3822 | ☑ |

| | |
|---|---|
| Battery Status 100 % | Temperature 23.8 °C |
| Electrical Test & Tag (AS/NZS 3760) | Electrodes Cleaned and Checked |

**Note:** Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Wilma Fouché Date: 20/11/19 Signed:

**Accessories List:**

| | | |
|---|---|---|
| User's Manual & USB | pH Sensor | Conductivity Sensor |
| Dissolved Oxygen Sensor with Wetting Cap | Redox (ORP) Sensor with Wetting Cap | Flow Cell 500ml |
| Charger Adaptor & Comm Cable | Desiccant Satchel | IPod & Transit Case |
| Storage Cap | Testing Cap | Calibration Test Tube |

External Battery Pack

**APPENDIX H**

# Tabulated Chemical Testing Results – Soil Vapour

GOLDER

**Chemical Data Table**

**Soil Vapour Samples**

Project number: 19131233
Project: EPA Albert Park Stage 2

| | | | | | | | Volatile Organic Compounds | | | | | | QC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1,1-Dichloroethene | cis-1,2-Dichloroethene | trans-1,2-dichloroethene | Trichloroethene | Tetrachloroethene | Vinyl chloride | Helium |
| | | | | | | | mg/m3 | mg/m3 | mg/m3 | mg/m3 | mg/m3 | mg/m3 | % by Vol |
| EQL | | | | | | | 0.002 | 0.002 | 0.002 | 0.0016 | 0.0034 | 0.0008 | 0.01 |
| *NEPM 1999 Table 1A(2) Commercial/Industrial D Soil Vapour VOCC HILs (0-1mBGL)* | | | | | | | | *0.3* | | *0.08* | *8* | *0.1* | |
| NEPM 1999 Table 1A(2) Residential A Soil Vapour VOCC HILs (0-1mBGL) | | | | | | | | 0.08 | | 0.02 | 2 | 0.03 | |
| **Sample Location** | **Depth (mBGL)** | **Sample ID** | **Sample Collection Date** | **Lab Report Number** | **Data Source / Comment** | **Sample Type** | | | | | | | |
| **Stage 1 & 2 - Active soil vapour samples** | | | | | | | | | | | | | |
| SV01-S | 1 | SV01 | 7/05/2019 | 217089 | JBS&G (2019) | Normal | - | 0.035 | 0.004 | *6.1* | 0.1 | <0.0015 | - |
| | | | 21/06/2019 | 220270 | JBS&G (2019) | Normal | - | 0.032 | <0.02 | *13* | 0.24 | <0.0077 | - |
| | | SV01-S | 4/11/2019 | 230172 | - | Normal | <0.0099 | 0.027 | <0.0099 | *11* | 0.24 | <0.0038 | <0.01 |
| SV01-D | 2 | SV01-D | 4/11/2019 | 230172 | - | Normal | <0.02 | *0.38* | <0.02 | 32 | 0.59 | <0.0077 | <0.01 |
| SV02 | 1 | SV02 | 7/05/2019 | 217089 | JBS&G (2019) | Normal | - | 0.022 | 0.07 | *5.3* | 0.071 | <0.0015 | - |
| | | | 21/06/2019 | 220270 | JBS&G (2019) | Normal | - | <0.0099 | 0.058 | *7.9* | 0.11 | <0.0038 | - |
| | | | 4/11/2019 | 230172 | - | Normal | <0.004 | 0.025 | 0.068 | *8.3* | 0.12 | <0.0015 | <0.01 |
| SV03-S | 1 | SV03_S | 7/05/2019 | 217089 | JBS&G (2019) | Normal | - | 0.08 | <0.0099 | *10* | 0.03 | <0.0038 | - |
| | | | 21/06/2019 | 220270 | JBS&G (2019) | Normal | - | 0.087 | <0.02 | *16* | 0.055 | <0.0077 | - |
| | | SV03-S | 4/11/2019 | 230172 | - | Normal | <0.0099 | 0.09 | <0.0099 | *18* | 0.06 | <0.0038 | <0.01 |
| SV03-D | 2 | SV03_D | 7/05/2019 | 217089 | JBS&G (2019) | Normal | - | 0.21 | 0.042 | 28 | 0.083 | <0.0077 | - |
| | | | 21/06/2019 | 220270 | JBS&G (2019) | Normal | - | 0.26 | <0.04 | 56 | 0.2 | <0.015 | - |
| | | SV03-D | 4/11/2019 | 230172 | - | Normal | <0.02 | 0.27 | 0.033 | 42 | 0.13 | <0.0077 | <0.01 |
| SV04 | 1 | SV04 | 7/05/2019 | 217089 | JBS&G (2019) | Normal | - | 0.031 | <0.004 | *3.4* | 0.03 | <0.0015 | - |
| | | | 21/06/2019 | 220270 | JBS&G (2019) | Normal | - | 0.028 | <0.0099 | *6.4* | 0.061 | <0.0038 | - |
| SV05 | 1 | SV05 | 7/05/2019 | 217089 | JBS&G (2019) | Normal | - | <0.002 | <0.002 | *1.2* | 0.12 | <0.0008 | - |
| | | | 21/06/2019 | 220270 | JBS&G (2019) | Normal | - | <0.0020 | <0.0020 | *1.3* | 0.11 | <0.0008 | - |
| SV06 | 1 | SV06 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | - | <0.002 | <0.002 | *0.59* | 0.048 | <0.0008 | - |
| | | | 4/11/2019 | 230172 | - | Normal | <0.002 | <0.002 | <0.002 | *0.39* | 0.068 | <0.0008 | <0.01 |
| SV07 | 1 | SV07 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | - | <0.002 | <0.002 | 0.024 | <0.0034 | <0.0008 | - |
| SV08 | 1 | SV08 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | - | <0.0066 | <0.0066 | *4.6* | 0.07 | <0.0026 | - |
| SV09 | 1 | SV09 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | - | <0.002 | <0.002 | *0.94* | 0.02 | <0.0008 | - |
| SV10 | 1 | SV10 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | - | <0.002 | <0.002 | 0.02 | <0.0034 | <0.0008 | - |
| SV11 | 1 | SV11 | 4/11/2019 | 230172 | - | Normal | 0.037 | <0.002 | <0.002 | 0.024 | 0.08 | <0.0008 | <0.01 |
| SV12 | 1 | SV12 | 4/11/2019 | 230172 | - | Normal | <0.002 | <0.002 | <0.002 | *0.26* | 0.21 | <0.0008 | <0.01 |
| SV13 | 1 | SV13 | 5/11/2019 | 230172 | - | Normal | <0.002 | <0.002 | <0.002 | *0.75* | 0.01 | <0.0008 | <0.01 |
| | | SV13-R | 5/11/2019 | 230172 | - | Intralab Dup | <0.002 | <0.002 | <0.002 | *0.81* | 0.01 | <0.0008 | <0.01 |
| | | SV13-R2 | 5/11/2019 | EN1907948 | - | Interlab Dup | <0.200 | <0.0200 | <0.200 | *0.854* | <0.340 | <0.0051 | - |
| SV14 | 1 | SV14 | 5/11/2019 | 230172 | - | Normal | <0.002 | <0.002 | <0.002 | *3.9* | 0.14 | <0.0008 | <0.01 |
| SV15 | 1 | SV15 | 5/11/2019 | 230172 | - | Normal | <0.002 | <0.002 | <0.002 | 0.038 | 0.02 | <0.0008 | <0.01 |
| SV16 | 1 | SV16 | 5/11/2019 | 230172 | - | Normal | <0.002 | <0.002 | <0.002 | *0.16* | 0.007 | <0.0008 | <0.01 |
| SV17 | 1 | SV17 | 5/11/2019 | 230172 | - | Normal | <0.002 | <0.002 | <0.002 | <0.0016 | <0.0034 | <0.0008 | <0.01 |
| SV18 | 1 | SV18 | 5/11/2019 | 230172 | - | Normal | <0.002 | <0.002 | <0.002 | *0.25* | 0.006 | <0.0008 | <0.01 |
| SV19 | 1 | SV19 | 5/11/2019 | 230172 | - | Normal | <0.002 | <0.002 | <0.002 | *0.18* | 0.01 | <0.0008 | <0.01 |
| **Stage 1 - Passive soil vapour samples** | | | | | | | | | | | | | |
| WMS01-Stage1 | 1 | WMS01 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | 0.02 | <0.009 | *5.1* | 0.07 | <0.122 | - |
| WMS02-Stage1 | 1 | WMS02 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | <0.008 | <0.009 | 0.02 | <0.004 | <0.121 | - |
| WMS03-Stage1 | 1 | WMS03 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | 0.02 | <0.009 | *9.4* | 0.03 | <0.121 | - |
| WMS04-Stage1 | 1 | WMS04 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | <0.008 | <0.009 | 0.02 | <0.004 | <0.121 | - |
| WMS05-Stage1 | 1 | WMS05 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | <0.008 | <0.009 | <0.006 | 0.009 | <0.122 | - |
| WMS06-Stage1 | 1 | WMS06 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | 0.01 | <0.009 | *5.2* | 0.06 | <0.122 | - |
| WMS07-Stage1 | 1 | WMS07 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | <0.008 | <0.009 | *0.58* | 0.07 | <0.122 | - |
| WMS08-Stage1 | 1 | WMS08 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | <0.008 | <0.009 | 0.009 | 0.04 | <0.122 | - |
| WMS09-Stage1 | 1 | WMS09 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | <0.008 | <0.009 | <0.006 | <0.004 | <0.121 | - |
| WMS10-Stage1 | 1 | WMS10 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | 0.02 | <0.009 | *5* | 0.04 | <0.121 | - |
| WMS11-Stage1 | 1 | WMS11 | 8/04/2019 | 224990 | JBS&G (2019) | Normal | - | <0.008 | <0.009 | <0.006 | 0.06 | <0.12 | - |
| **Stage 2 - Passive air samples (service pits)** | | | | | | | | | | | | | |
| WMS01 | 1 | WMS01 | 6/11/2019 | 235836 | Telstra pit | Normal | <0.011 | <0.008 | <0.009 | <0.006 | <0.004 | <0.122 | - |
| WMS02 | 0.6 | WMS02 | 6/11/2019 | 235836 | Stormwater entry pit | Normal | <0.011 | <0.008 | <0.009 | <0.006 | <0.004 | <0.121 | - |
| WMS03 | 0.5 | WMS03 | 6/11/2019 | 235836 | Stormwater pit | Normal | <0.011 | <0.008 | <0.009 | <0.006 | <0.004 | <0.122 | - |
| WMS04 | 0.2 | WMS04 | 6/11/2019 | 235836 | Stormwater entry pit | Normal | <0.011 | <0.008 | <0.009 | <0.006 | <0.004 | <0.122 | - |
| WMS05 | 0.2 | WMS05 | 6/11/2019 | 235836 | Stormwater grate | Normal | <0.011 | <0.008 | <0.009 | <0.006 | <0.004 | <0.123 | - |
| WMS06 | 0.5 | WMS06 | 6/11/2019 | 235836 | Telstra pit | Normal | <0.011 | <0.008 | <0.009 | 0.006 | <0.004 | <0.123 | - |
| | | WMS-DUPA | 6/11/2019 | 235836 | Telstra pit | Intralab Dup | <0.011 | <0.008 | <0.009 | 0.006 | <0.004 | <0.123 | - |
| | | WMS-DUPB | 6/11/2019 | M191669 | Telstra pit | Interlab Dup | <0.022 | <0.0095 | <0.0099 | 0.0064 | <0.0045 | <0.036 | - |
| WMS07 | 0.6 | WMS07 | 6/11/2019 | 235836 | Stormwater entry pit | Normal | <0.011 | <0.008 | <0.009 | <0.006 | <0.004 | <0.123 | - |
| WMS08 | 1 | WMS08 | 6/11/2019 | 235836 | Stormwater entry pit | Normal | <0.011 | <0.008 | <0.009 | <0.006 | <0.004 | <0.124 | - |
| WMS09 | 1 | WMS09 | 6/11/2019 | 235836 | Stormwater entry pit | Normal | <0.011 | <0.008 | <0.009 | <0.006 | <0.004 | <0.123 | - |

Prepared by: LO Date Prepared: 7/02/2020
Checked by: JGC Date Checked: 7/02/2020

**APPENDIX I**

# Tabulated Chemical Testing Results – Groundwater

GOLDER

**Chemical Data Table**

**Groundwater Samples**

Project number: 19131233
Project: EPA Albert Park Stage 2

| | Volatile Organic Compounds | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1,1,1-Trichloroethane | 1,1-Dichloroethane | 1,2-Dichloroethane | 1,1-Dichloroethene | cis-1,2-Dichloroethene | trans-1,2-dichloroethene | Bromochloromethane | Bromomethane | Carbon tetrachloride | Chloroethane | Dichlorodifluoromethane | Dichloromethane | Hexachlorobutadiene | Trichloroethene | Tetrachloroethene | Trichlorofluoromethane | Vinyl chloride |
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| EQL | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0005 | 0.0005 | 0.00005 | 0.0005 | 0.0005 | 0.001 | 0.00004 | 0.00005 | 0.00005 | 0.0005 | 0.0002 |
| ADWG 2011 Health | | | 0.003 | 0.03 | | | | 0.001 | 0.003 | | | 0.004 | 0.0007 | 0.02 ^ | 0.05 | | 0.0003 |
| ADWG 2011 Aesthetic | | | | | | | | | | | | | | | | | |
| **GMRRW (2008) - ADWG 2011 Health (x10 for inorganics)** | | | **0.003** | **0.03** | | | | **0.001** | **0.003** | | | **0.004** | **0.0007** | **0.02 ^** | **0.05** | | **0.0003** |
| ANZECC 2000 SW Long-Term Irrigation Water Protection | | | | | | | | | | | | | | | | | |
| *ASC NEPM 1999 HSL for Vapour Intrusion - Residential, 2-4mBGL, clay* | | | | | | | | | | | | | | | | | |
| *ASC NEPM 1999 HSL for Vapour Intrusion - Commercial, 2-4mBGL, clay* | | | | | | | | | | | | | | | | | |

| Well ID | Sample Date | Sample ID | Lab Report Number | Sample Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GW01 | 21/11/2019 | GW01 | EM1920038 | Normal | <0.0001 | <0.0001 | 0.0004 | 0.0002 | 0.0348 | 0.0018 | <0.0005 | <0.0005 | <0.00005 | <0.0005 | <0.0005 | <0.0010 | <0.00004 | **0.186** | 0.00036 | <0.0005 | <0.0003 |
| GW02 | 21/11/2019 | GW02 | EM1920038 | Normal | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.0013 | 0.0002 | <0.0005 | <0.0005 | <0.00005 | <0.0005 | <0.0005 | <0.0010 | <0.00004 | 0.0177 | 0.00005 | <0.0005 | <0.0003 |
| | | DUP1A | EM1920038 | Field_D | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.0015 | 0.0002 | <0.0005 | <0.0005 | <0.00005 | <0.0005 | <0.0005 | <0.0010 | <0.00004 | 0.0175 | 0.00005 | <0.0005 | <0.0003 |
| | | DUP1B | 19037 | Interlab_D | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.0008 | 0.0002 | <0.0005 | <0.002 | <0.0001 | <0.002 | <0.002 | - | <0.0002 | 0.014 | <0.0001 | <0.002 | <0.0002 |
| GW03 | 21/11/2019 | GW03 | EM1920038 | Normal | <0.0001 | <0.0001 | 0.0008 | 0.0039 | 0.0803 | 0.0026 | <0.0005 | <0.0005 | <0.00005 | <0.0005 | <0.0005 | <0.0010 | <0.00004 | **1.13** | 0.0104 | <0.0005 | **0.0023** |
| GW04 | 21/11/2019 | GW04 | EM1920038 | Normal | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0005 | <0.0005 | <0.00005 | <0.0005 | <0.0005 | <0.0010 | <0.00004 | 0.00008 | <0.00005 | <0.0005 | <0.0003 |
| GW05 | 21/11/2019 | GW05 | EM1920038 | Normal | <0.0001 | <0.0001 | <0.0001 | 0.0001 | 0.0056 | 0.0003 | <0.0005 | <0.0005 | <0.00005 | <0.0005 | <0.0005 | <0.0010 | <0.00004 | **0.177** | 0.00035 | <0.0005 | <0.0003 |

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Checked by: JGC Date Checked: 7/02/2020

^ World Health Organisation (4th Ed. 2017) Drinking Water

| | Total Recoverable Hydrocarbons | | | | | | | | | | | | BTEX | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TRH C6 - C9 Fraction | TRH C10 - C14 Fraction | TRH C15 - C28 Fraction | TRH C29 - C36 Fraction | TRH+C10 - C36 (Sum of total) (Lab Reported) | TRH+C10 - C40 (Sum of total) (Lab Reported) | TRH C6 - C10 Fraction F1 | TRH C6 - C10 Fraction Less BTEX F1 | TRH >C10 - C16 Fraction F2 | TRH >C10 - C16 Fraction Less Naphthalene F2 | TRH >C16 - C34 Fraction F3 | TRH >C34 - C40 Fraction F4 | Benzene | Toluene | Ethylbenzene | Xylenes (m & p) | Xylene (o) | Xylenes (Sum of total) (Lab Reported) | Total BTEX |
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| EQL | 0.01 | 0.05 | 0.1 | 0.05 | 0.05 | 0.05 | 0.01 | 0.01 | 0.05 | 0.05 | 0.1 | 0.1 | 0.0001 | 0.0001 | 0.0001 | 0.0002 | 0.0001 | 0.001 | 0.001 |
| ADWG 2011 Health | | | | | | | | | | | | | 0.001 | 0.8 | 0.3 | | | 0.6 | |
| ADWG 2011 Aesthetic | | | | | | | | | | | | | | 0.025 | 0.003 | | | 0.02 | |
| **GMRRW (2008) - ADWG 2011 Health (x10 for inorganics)** | | | | | | | | | | | | | **0.001** | **0.8** | **0.3** | | | **0.6** | |
| ANZECC 2000 SW Long-Term Irrigation Water Protection | | | | | | | | | | | | | | | | | | | |
| ***ASC NEPM 1999 HSL for Vapour Intrusion - Residential, 2-4mBGL, clay*** | | | | | | | | ***NL*** | ***NL*** | | | | ***5*** | ***NL*** | ***NL*** | | | ***NL*** | |
| ***ASC NEPM 1999 HSL for Vapour Intrusion - Commercial, 2-4mBGL, clay*** | | | | | | | | ***NL*** | ***NL*** | | | | ***30*** | ***NL*** | ***NL*** | | | ***NL*** | |

| Well ID | Sample Date | Sample ID | Lab Report Number | Sample Type | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GW01 | 21/11/2019 | GW01 | EM1920038 | Normal | 0.17 | <0.05 | <0.1 | <0.05 | <0.05 | <0.1 | 0.16 | 0.16 | <0.1 | <0.1 | <0.1 | <0.1 | <0.001 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.001 |
| GW02 | 21/11/2019 | GW02 | EM1920038 | Normal | <0.02 | <0.05 | <0.1 | <0.05 | <0.05 | <0.1 | <0.02 | <0.02 | <0.1 | <0.1 | <0.1 | <0.1 | <0.001 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.001 |
| | | DUP1A | EM1920038 | Field_D | <0.02 | <0.05 | <0.1 | <0.05 | <0.05 | <0.1 | <0.02 | <0.02 | <0.1 | <0.1 | <0.1 | <0.1 | <0.001 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.001 |
| | | DUP1B | 19037 | Interlab_D | 0.023 | <0.05 | <0.1 | <0.1 | <0.05 | <0.05 | 0.025 | 0.025 | <0.05 | <0.05 | <0.1 | <0.1 | <0.0001 | <0.0001 | <0.0001 | <0.0002 | <0.0001 | <0.001 | - |
| GW03 | 21/11/2019 | GW03 | EM1920038 | Normal | 0.84 | <0.05 | <0.1 | <0.05 | <0.05 | <0.1 | 0.8 | 0.8 | <0.1 | <0.1 | <0.1 | <0.1 | <0.001 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.001 |
| GW04 | 21/11/2019 | GW04 | EM1920038 | Normal | 0.05 | <0.05 | <0.1 | <0.05 | <0.05 | <0.1 | 0.04 | 0.04 | <0.1 | <0.1 | <0.1 | <0.1 | <0.001 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.001 |
| GW05 | 21/11/2019 | GW05 | EM1920038 | Normal | 0.14 | <0.05 | <0.1 | <0.05 | <0.05 | <0.1 | 0.14 | 0.14 | <0.1 | <0.1 | <0.1 | <0.1 | <0.001 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.001 |

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Checked by: JGC Date Checked: 7/02/2020

NL: non-limiting

GOLDER

**Chemical Data Table**

**Groundwater Samples**

Project number: 19131233
Project: EPA Albert Park Stage 2

| | Heavy Metals | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Arsenic (filtered) | Barium (filtered) | Beryllium (filtered) | Boron (filtered) | Cadmium (filtered) | Chromium (filtered) | Cobalt (filtered) | Copper (filtered) | Ferrous Iron | Lead (filtered) | Manganese (filtered) | Mercury (filtered) | Nickel (filtered) | Selenium (filtered) | Vanadium (filtered) | Zinc (filtered) |
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| EQL | 0.001 | 0.001 | 0.0005 | 0.05 | 0.0001 | 0.001 | 0.001 | 0.001 | 0.05 | 0.001 | 0.001 | 0.00005 | 0.001 | 0.01 | 0.01 | 0.001 |
| ADWG 2011 Health | 0.01 | 2 | 0.06 | 4 | 0.002 | | | 2 | | 0.01 | 0.5 | 0.001 | 0.02 | 0.01 | | |
| ADWG 2011 Aesthetic | | | | | | | | 1 | | | 0.1 | | | | | 3 |
| **GMRRW (2008) - ADWG 2011 Health (x10 for inorganics)** | **0.1** | **20** | **0.6** | **40** | **0.02** | **0.5** | | **20** | | **0.1** | **5** | **0.01** | **0.2** | **0.1** | | |
| ANZECC 2000 SW Long-Term Irrigation Water Protection | 0.1 | | 0.1 | 0.5 | 0.01 | | 0.05 | 0.2 | | 2 | 0.2 | 0.002 | 0.2 | 0.02 | 0.1 | 2 |
| *ASC NEPM 1999 HSL for Vapour Intrusion - Residential, 2-4mBGL, clay* | | | | | | | | | | | | | | | | |
| *ASC NEPM 1999 HSL for Vapour Intrusion - Commercial, 2-4mBGL, clay* | | | | | | | | | | | | | | | | |

| Well ID | Sample Date | Sample ID | Lab Report Number | Sample Type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GW01 | 21/11/2019 | GW01 | EM1920038 | Normal | <0.001 | 0.079 | <0.001 | 1.18 | <0.0001 | 0.001 | <0.001 | <0.001 | <0.05 | <0.001 | 0.003 | <0.0001 | <0.001 | <0.01 | <0.01 | <0.005 |
| GW02 | 21/11/2019 | GW02 | EM1920038 | Normal | <0.001 | 0.065 | <0.001 | 1.47 | <0.0001 | <0.001 | <0.001 | <0.001 | <0.05 | <0.001 | 0.002 | <0.0001 | <0.001 | <0.01 | <0.01 | <0.005 |
| | | DUP1A | EM1920038 | Field_D | <0.001 | 0.065 | <0.001 | 1.60 | <0.0001 | <0.001 | <0.001 | <0.001 | <0.05 | <0.001 | 0.002 | <0.0001 | <0.001 | <0.01 | <0.01 | <0.005 |
| | | DUP1B | 19037 | Interlab_D | <0.001 | 0.074 | <0.0005 | - | <0.0001 | <0.001 | <0.001 | <0.001 | <0.05 | <0.001 | <0.005 | <0.00005 | <0.001 | 0.007 | - | 0.005 |
| GW03 | 21/11/2019 | GW03 | EM1920038 | Normal | <0.001 | 0.041 | <0.001 | 2.05 | <0.0001 | <0.001 | <0.001 | <0.001 | <0.05 | <0.001 | 0.026 | <0.0001 | <0.001 | <0.01 | <0.01 | 0.006 |
| GW04 | 21/11/2019 | GW04 | EM1920038 | Normal | <0.001 | 0.045 | <0.001 | 2.59 | <0.0001 | 0.001 | <0.001 | <0.001 | <0.05 | <0.001 | 0.001 | <0.0001 | <0.001 | 0.02 | <0.01 | 0.007 |
| GW05 | 21/11/2019 | GW05 | EM1920038 | Normal | 0.001 | 0.263 | <0.001 | 1.81 | 0.0007 | 0.012 | <0.001 | 0.001 | <0.05 | <0.001 | 0.002 | <0.0001 | 0.001 | 0.01 | <0.01 | 0.006 |

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Checked by: JGC Date Checked: 7/02/2020

* Ferrous Iron hold time of 24 hours was not achieved. Results should be considered accordingly.

| | Polycyclic Aromatic Hydrocarbons (PAH) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Acenaphthene | Acenaphthylene | Anthracene | Benz(a)anthracene | Benzo(a)pyrene | Benzo(b)&(j)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-c,d)pyrene | Naphthalene | Phenanthrene | Pyrene | Carcinogenic PAH (BaP TEQ) (lower bound) | Total PAHs |
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| EQL | 0.001 | 0.001 | 0.001 | 0.001 | 0.0005 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0005 | 0.0005 |
| ADWG 2011 Health | | | | | 0.00001 | | | | | | | | | | | | | |
| ADWG 2011 Aesthetic | | | | | | | | | | | | | | | | | | |
| **GMRRW (2008) - ADWG 2011 Health (x10 for inorganics)** | | | | | **0.0001** | | | | | | | | | | | | | |
| ANZECC 2000 SW Long-Term Irrigation Water Protection | | | | | | | | | | | | | | | | | | |
| *ASC NEPM 1999 HSL for Vapour Intrusion - Residential, 2-4mBGL, clay* | | | | | | | | | | | | | | | | | | |
| *ASC NEPM 1999 HSL for Vapour Intrusion - Commercial, 2-4mBGL, clay* | | | | | | | | | | | | | | | | | | |

| Well ID | Sample Date | Sample ID | Lab Report Number | Sample Type | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GW01 | 21/11/2019 | GW01 | EM1920038 | Normal | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0005 |
| GW02 | 21/11/2019 | GW02 | EM1920038 | Normal | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0005 |
| | | DUP1A | EM1920038 | Field_D | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0005 |
| | | DUP1B | 19037 | Interlab_D | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | <0.001 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | <0.001 |
| GW03 | 21/11/2019 | GW03 | EM1920038 | Normal | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0005 |
| GW04 | 21/11/2019 | GW04 | EM1920038 | Normal | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0005 |
| GW05 | 21/11/2019 | GW05 | EM1920038 | Normal | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0005 | <0.0005 |

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Checked by: JGC Date Checked: 7/02/2020

GOLDER

**Chemical Data Table**

**Groundwater Samples**

Project number: 19131233
Project: EPA Albert Park Stage 2

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Other | | | Other | | | | | | | | | | | | | | | | |
| | | | | Carbon Dioxide | CO2 (Free) | pH (Lab)* | Total dissolved solids by calculation | Methane | Electrical Conductivity @ 25°C | Sodium (filtered) | Potassium (filtered) | Calcium (filtered) | Magnesium (filtered) | Chloride | Sulphate (as SO4) (filtered) | Bicarbonate Alkalinity (as CaCO3) | Carbonate Alkalinity (as CaCO3) | Hydroxide Alkalinity (as CaCO3) | Total Alkalinity (as CaCO3) | Nitrate (as N) | Fluoride | Total Anions | Total Cations | Ionic Balance (Lab) | Hardness (as CaCO3) (filtered) |
| | | | | mg/L | mg/L | pH_Units | mg/L | ug/L | uS/cm | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | meq/L | meq/L | % | mg/L |
| EQL | | | | 1 | 1 | 0.01 | 1 | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.01 | 0.1 | 0.01 | 0.01 | 0.01 | 1 |
| ADWG 2011 Health | | | | | | | | | | | | | | | 500 | | | | | | 1.5 | | | | |
| ADWG 2011 Aesthetic | | | | | | 6.5-8.5 | 600 | | | 180 | | | | 250 | 250 | | | | | | | | | | 200 |
| **GMRRW (2008) - ADWG 2011 Health (x10 for inorganics)** | | | | | | | | | | | | | | | **5,000** | | | | | | **15** | | | | |
| ANZECC 2000 SW Long-Term Irrigation Water Protection | | | | | | 6-9 | | | | 115 | | | | 40 | | | | | | | 1 | | | | |
| *ASC NEPM 1999 HSL for Vapour Intrusion - Residential, 2-4mBGL, clay* | | | | | | | | | | | | | | | | | | | | | | | | | |
| *ASC NEPM 1999 HSL for Vapour Intrusion - Commercial, 2-4mBGL, clay* | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Well ID** | **Sample Date** | **Sample ID** | **Lab Report Number** | **Sample Type** | | | | | | | | | | | | | | | | | | | | | |
| GW01 | 21/11/2019 | GW01 | EM1920038 | Normal | 768 | 64 | 7.95 | 1,690 | <10 | 2,600 | 385 | 14 | 51 | 80 | 396 | 139 | 800 | <1 | <1 | 800 | 3.41 | 2.1 | 30.0 | 26.2 | 6.78 | 457 |
| GW02 | 21/11/2019 | GW02 | EM1920038 | Normal | 1,320 | 84 | 8.12 | 3,390 | <10 | 5,210 | 996 | 11 | 37 | 68 | 851 | 279 | 1,400 | <1 | <1 | 1,400 | 0.04 | 2.7 | 57.8 | 51.0 | 6.19 | 372 |
| | | DUP1A | EM1920038 | Field_D | 1,330 | 76 | 8.12 | 3,260 | <10 | 5,020 | 1,000 | 12 | 36 | 69 | 854 | 267 | 1,420 | <1 | <1 | 1,420 | 0.04 | 3.0 | 58.0 | 51.3 | 6.17 | 374 |
| | | DUP1B | 19037 | Interlab_D | - | <5 | - | 3,300 | - | - | 1,000 | 8.1 | 36 | 63 | 750 | 280 | 1,400 | <5 | <5 | 1,400 | 0.021 | - | - | - | -3.1 | 350 |
| GW03 | 21/11/2019 | GW03 | EM1920038 | Normal | 1,200 | 106 | 8.00 | 5,130 | <10 | 7,890 | 1,600 | 23 | 70 | 134 | 1,630 | 582 | 1,240 | <1 | <1 | 1,240 | 1.15 | 2.2 | 82.9 | 84.7 | 1.09 | 727 |
| GW04 | 21/11/2019 | GW04 | EM1920038 | Normal | 851 | 47 | 8.15 | 1,530 | <10 | 2,360 | 469 | 10 | 16 | 23 | 185 | 132 | 914 | <1 | <1 | 914 | 15.2 | 2.6 | 26.2 | 23.3 | 5.81 | 135 |
| GW05 | 21/11/2019 | GW05 | EM1920038 | Normal | 779 | 54 | 8.02 | 2,240 | <10 | 3,450 | 527 | 18 | 65 | 99 | 568 | 260 | 823 | <1 | <1 | 823 | 25.7 | 2.1 | 37.9 | 34.8 | 4.27 | 570 |

Prepared by: LO Date Prepared: 7/02/2020
Checked by: JGC Date Checked: 7/02/2020

* pH hold time of 6 hours was not achieved. Results should be considered accordingly.

**Soils testing - Determination of the moisture content of soil**

Oven drying method (standard method)

**AS 1289.2.1.1-2005**

GOLDER

| | | | |
|---|---|---|---|
| **Test request ID:** | **TRA19-0461** | **Lab sample IDs:** | 201911180-201911182 |
| **Client:** | EPA | | |
| **Client address:** | | | |
| **Project ID:** | **19131233** | **Lab report ref.:** | LADL_19038720_1 |


**Golder Associates Pty Ltd**

**ADELAIDE GEOTECHNICAL LABORATORY**

118 Franklin Street,
Adelaide,
South Australia 5000


**Project name:** Albert Park Stage 2

**Location:** Albert Park

**Project reference:**

## TEST REPORT - SUMMARY OF ANALYSIS

| Lab sample ID | Exploratory hole reference | Sample depth (m) | Specimen reference | Specimen description *(Based on visual and tactile assessment)* | Moisture content |
|---|---|---|---|---|---|
| LADL201911180 | GW02 | 0.50 | GW02 0.5-0.8 | | 16.6% |
| | | 0.80 | | | As Rcvd. |
| LADL201911181 | GW02 | 1.50 | GW02 1.5-2.0 | | 19.6% |
| | | 2.00 | | | As Rcvd. |
| LADL201911182 | GW03 | 0.50 | GW03 0.5-0.9 | | 15.6% |
| | | 0.90 | | | As Rcvd. |
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**Notes:**

**Definitions:**

ND = Not determined

**Specimen prepared by:** RD

**Result reviewed by:** GMiller

**Test performed by:** RD

**Date reported:** **03/12/2019**

| | | |
|---|---|---|
| **Cert. ref.:** | **19131233_TRA19-0461_SMC_201911180-201911182_LADL_19038720_1** | **Approved signatory:** |
| NATA | **NATA accreditation number: 1961 - Site:1954 - Adelaide**<br>Accredited for compliance with ISO/IEC 17025 - Testing | |
| | THIS DOCUMENT SHALL ONLY BE REPRODUCED IN FULL | **Grant Miller - Senior Technician** |


**Phone:** +61 (08) 8213 2100 **Fax:** +61 (08) 8213 2101 **E-mail:** adlgeolab@golder.com.au **Web:** www.golder.com.au

## UNIT WEIGHT – MOISTURE CONTENT AND DRY DENSITY OF TUBE SAMPLES TEST REPORT

GOLDER

| | | | |
|---|---|---|---|
| **Client:** | EPA | **Project No.:** | 19131233/R1 |
| **Project:** | Albert Park Stage 2 | **Date:** | 3/12/2019 |
| **Location:** | Albert Park | **Report No.:** | LADL_19038720_1 |

**Test procedure: AS1289.2.1.1 & In-house Method**

| | | | |
|---|---|---|---|
| **Laboratory Reference Number** | LADL201911180 | LADL201911181 | LADL201911182 |
| **Sample Identification** | GW02<br>GW02 0.5-0.8 | GW02<br>GW02 1.5-2.0 | GW03<br>GW03 0.5-0.9 |
| **Sample Description** | | | |
| **Date Sampled** | 14/11/2019 | 14/11/2019 | 14/11/19 |
| **Wet Density (t/m$^3$)** | 1.79 | 2.07 | 1.89 |
| **Dry Density (t/m$^3$)** | 1.54 | 1.73 | 1.64 |
| **Moisture Content (%)** | 16.6 | 19.6 | 15.6 |

Notes: Density determinations were carried out by direct measurement

AD1113.xls
031219

Grant Miller - Senior Geotechnical Technician

GOLDER ASSOCIATES PTY LTD
118 FRANKLIN STREET, ADELAIDE, SOUTH AUSTRALIA 5000, AUSTRALIA
T: +61 8 8213 2100 F: +61 8 8213 2101

A.B.N. 64 006 107 857

**APPENDIX J**

# Tabulated Quality Control Sample Results

GOLDER

**Data Quality Sample Chemical Table**

**Soil Vapour Duplicate Samples**

Project number: 19131233
Project: EPA Albert Park Stage 2

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Field ID** | | WMS06 | WMS-DUPA | | WMS06 | WMS-DUPB | | SV13 | SV13-R | | SV13 | SV13-R2 | |
| | **Matrix Type** | | gas | gas | | gas | gas | | gas | gas | | gas | gas | |
| | **Date** | | | | | | | | 5/11/2019 | 5/11/2019 | | 5/11/2019 | 5/11/2019 | |
| | **Lab Report Number** | | 235836 | 235836 | RPD | 235836 | M191669 | RPD | 230172 | 230172 | RPD | 230172 | EN1907948 | RPD |
| | **Unit** | EQL | | | | | | | | | | | | |
| **Volatile Organic Compounds** | | | | | | | | | | | | | | |
| **1,1-Dichloroethene** | **mg/m3** | 0.002 | <0.011 | <0.011 | 0 | <0.011 | <0.022 | 0 | <0.002 | <0.002 | 0 | <0.002 | <0.200 | 0 |
| | **ppmv** | | - | - | - | - | - | - | - | - | - | - | <0.0500 | - |
| **cis-1,2-Dichloroethene** | **mg/m3** | 0.002 | <0.008 | <0.008 | 0 | <0.008 | <0.0095 | 0 | <0.002 | <0.002 | 0 | <0.002 | <0.0200 | 0 |
| | **ppmv** | | - | - | - | - | - | - | - | - | - | - | <0.0050 | - |
| **trans-1,2-dichloroethene** | **mg/m3** | 0.002 | <0.009 | <0.009 | 0 | <0.009 | <0.0099 | 0 | <0.002 | <0.002 | 0 | <0.002 | <0.200 | 0 |
| | **ppmv** | | - | - | - | - | - | - | - | - | - | - | <0.0500 | - |
| **Trichloroethene** | **mg/m3** | 0.0016 | 0.006 | 0.006 | 0 | 0.006 | 0.0064 | 6 | 0.75 | 0.81 | 8 | 0.75 | 0.854 | 13 |
| | **ppmv** | | - | - | - | - | - | - | - | - | - | - | 0.159 | - |
| **Tetrachloroethene** | **mg/m3** | 0.0034 | <0.004 | <0.004 | 0 | <0.004 | <0.0045 | 0 | 0.01 | 0.01 | 0 | 0.01 | <0.340 | 0 |
| | **ppmv** | | - | - | - | - | - | - | - | - | - | - | <0.0500 | - |
| **Vinyl chloride** | **mg/m3** | 0.0008 | <0.123 | <0.123 | 0 | <0.123 | <0.036 | 0 | <0.0008 | <0.0008 | 0 | <0.0008 | <0.0051 | 0 |
| | **ppmv** | | - | - | - | - | - | - | - | - | - | - | <0.0020 | - |
| **Other** | | | | | | | | | | | | | | |
| **Helium** | **% by Vol** | 0.01 | - | - | - | - | - | - | <0.01 | <0.01 | 0 | <0.01 | - | - |
| | **Mol %** | | - | - | - | - | - | - | - | - | - | - | <0.012 | - |
| | **mg/m³** | | - | - | - | - | - | - | - | - | - | - | <20 | - |

GOLDER

**Chemical Data Table**

Project number: 19131233
Project: EPA Albert Park Stage 2

**Groundwater Duplicate Samples**

| | | | Field ID | GW02 | DUP1A | | GW02 | DUP1B | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Matrix Type | water | water | | water | water | |
| | | | Date | 21/11/2019 | 21/11/2019 | | 21/11/2019 | 21/11/2019 | |
| | | | Lab Report Number | EM1920038 | EM1920038 | RPD | EM1920038 | 19037 | RPD |
| | Unit | EQL | | | | | | | |
| **Volatile Organic Compounds** | | | | | | | | | |
| **1,1,1-Trichloroethane** | mg/L | 0.0001 | | <0.0001 | <0.0001 | 0 | <0.0001 | <0.0001 | 0 |
| **1,1-Dichloroethane** | mg/L | 0.0001 | | <0.0001 | <0.0001 | 0 | <0.0001 | <0.0001 | 0 |
| **1,2-Dichloroethane** | mg/L | 0.0001 | | <0.0001 | <0.0001 | 0 | <0.0001 | <0.0001 | 0 |
| **1,1-Dichloroethene** | mg/L | 0.0001 | | <0.0001 | <0.0001 | 0 | <0.0001 | <0.0001 | 0 |
| **cis-1,2-Dichloroethene** | mg/L | 0.0001 | | 0.0013 | 0.0015 | 14 | 0.0013 | 0.0008 | 48 |
| **trans-1,2-dichloroethene** | mg/L | 0.0001 | | 0.0002 | 0.0002 | 0 | 0.0002 | 0.0002 | 0 |
| **Bromochloromethane** | mg/L | 0.0005 | | <0.0005 | <0.0005 | 0 | <0.0005 | <0.0005 | 0 |
| **Bromomethane** | mg/L | 0.0005 | | <0.0005 | <0.0005 | 0 | <0.0005 | <0.002 | 0 |
| **Carbon tetrachloride** | mg/L | 0.00005 | | <0.00005 | <0.00005 | 0 | <0.00005 | <0.0001 | 0 |
| **Chloroethane** | mg/L | 0.0005 | | <0.0005 | <0.0005 | 0 | <0.0005 | <0.002 | 0 |
| **Dichlorodifluoromethane** | mg/L | 0.0005 | | <0.0005 | <0.0005 | 0 | <0.0005 | <0.002 | 0 |
| **Dichloromethane** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | - | - |
| **Hexachlorobutadiene** | mg/L | 0.00004 | | <0.00004 | <0.00004 | 0 | <0.00004 | <0.0002 | 0 |
| **Trichloroethene** | mg/L | 0.00005 | | 0.0177 | 0.0175 | 1 | 0.0177 | 0.014 | 23 |
| **Tetrachloroethene** | mg/L | 0.00005 | | 0.00005 | 0.00005 | 0 | 0.00005 | <0.0001 | 0 |
| **Trichlorofluoromethane** | mg/L | 0.0005 | | <0.0005 | <0.0005 | 0 | <0.0005 | <0.002 | 0 |
| **Vinyl chloride** | mg/L | 0.0002 | | <0.0003 | <0.0003 | 0 | <0.0003 | <0.0002 | 0 |
| **Total Recoverable Hydrocarbons** | | | | | | | | | |
| **TRH C6 - C9 Fraction** | mg/L | 0.01 | | <0.02 | <0.02 | 0 | <0.02 | 0.023 | 14 |
| **TRH C10 - C14 Fraction** | mg/L | 0.05 | | <0.05 | <0.05 | 0 | <0.05 | <0.05 | 0 |
| **TRH C15 - C28 Fraction** | mg/L | 0.1 | | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 |
| **TRH C29 - C36 Fraction** | mg/L | 0.05 | | <0.05 | <0.05 | 0 | <0.05 | <0.1 | 0 |
| **TRH+C10 - C36 (Sum of total) (Lab Reported)** | mg/L | 0.05 | | <0.05 | <0.05 | 0 | <0.05 | <0.05 | 0 |
| **TRH+C10 - C40 (Sum of total) (Lab Reported)** | mg/L | 0.05 | | <0.1 | <0.1 | 0 | <0.1 | <0.05 | 0 |
| **TRH C6 - C10 Fraction F1** | mg/L | 0.01 | | <0.02 | <0.02 | 0 | <0.02 | 0.025 | 22 |
| **TRH >C10 - C16 Fraction F2** | mg/L | 0.05 | | <0.1 | <0.1 | 0 | <0.1 | <0.05 | 0 |
| **TRH >C10 - C16 Fraction Less Naphthalene F2** | mg/L | 0.05 | | <0.1 | <0.1 | 0 | <0.1 | <0.05 | 0 |
| **TRH >C16 - C34 Fraction F3** | mg/L | 0.1 | | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 |
| **TRH >C34 - C40 Fraction F4** | mg/L | 0.1 | | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 |
| **BTEX** | | | | | | | | | |
| **Benzene** | mg/L | 0.0001 | | <0.001 | <0.001 | 0 | <0.001 | <0.0001 | 0 |
| **Toluene** | mg/L | 0.0001 | | <0.002 | <0.002 | 0 | <0.002 | <0.0001 | 0 |
| **Ethylbenzene** | mg/L | 0.0001 | | <0.002 | <0.002 | 0 | <0.002 | <0.0001 | 0 |
| **Xylenes (m & p)** | mg/L | 0.0002 | | <0.002 | <0.002 | 0 | <0.002 | <0.0002 | 0 |
| **Xylene (o)** | mg/L | 0.0001 | | <0.002 | <0.002 | 0 | <0.002 | <0.0001 | 0 |
| **Xylenes (Sum of total) (Lab Reported)** | mg/L | 0.001 | | <0.002 | <0.002 | 0 | <0.002 | <0.001 | 0 |
| **Total BTEX** | mg/L | 0.001 | | <0.001 | <0.001 | 0 | <0.001 | - | - |

**Groundwater Duplicate Samples**

| | Unit | EQL | Field ID | GW02 | DUP1A | RPD | GW02 | DUP1B | RPD |
|---|---|---|---|---|---|---|---|---|---|
| | | | Matrix Type | water | water | | water | water | |
| | | | Date | 21/11/2019 | 21/11/2019 | | 21/11/2019 | 21/11/2019 | |
| | | | Lab Report Number | EM1920038 | EM1920038 | | EM1920038 | 19037 | |
| **Heavy Metals** | | | | | | | | | |
| **Arsenic (filtered)** | mg/L | 0.001 | | <0.001 | <0.001 | 0 | <0.001 | <0.001 | 0 |
| **Barium (filtered)** | mg/L | 0.001 | | 0.065 | 0.065 | 0 | 0.065 | 0.074 | 13 |
| **Beryllium (filtered)** | mg/L | 0.0005 | | <0.001 | <0.001 | 0 | <0.001 | <0.0005 | 0 |
| **Boron (filtered)** | mg/L | 0.05 | | 1.47 | 1.60 | 8 | 1.47 | - | - |
| **Cadmium (filtered)** | mg/L | 0.0001 | | <0.0001 | <0.0001 | 0 | <0.0001 | <0.0001 | 0 |
| **Chromium (filtered)** | mg/L | 0.001 | | <0.001 | <0.001 | 0 | <0.001 | <0.001 | 0 |
| **Cobalt (filtered)** | mg/L | 0.001 | | <0.001 | <0.001 | 0 | <0.001 | <0.001 | 0 |
| **Copper (filtered)** | mg/L | 0.001 | | <0.001 | <0.001 | 0 | <0.001 | <0.001 | 0 |
| **Iron (ferrous)** | mg/L | 0.05 | | <0.05 | <0.05 | 0 | <0.05 | <0.05 | 0 |
| **Lead (filtered)** | mg/L | 0.001 | | <0.001 | <0.001 | 0 | <0.001 | <0.001 | 0 |
| **Manganese (filtered)** | mg/L | 0.001 | | 0.002 | 0.002 | 0 | 0.002 | <0.005 | 0 |
| **Mercury (filtered)** | mg/L | 0.00005 | | <0.0001 | <0.0001 | 0 | <0.0001 | <0.00005 | 0 |
| **Nickel (filtered)** | mg/L | 0.001 | | <0.001 | <0.001 | 0 | <0.001 | <0.001 | 0 |
| **Selenium (filtered)** | mg/L | 0.001 | | <0.01 | <0.01 | 0 | <0.01 | 0.007 | 0 |
| **Vanadium (filtered)** | mg/L | 0.01 | | <0.01 | <0.01 | 0 | <0.01 | - | - |
| **Zinc (filtered)** | mg/L | 0.001 | | <0.005 | <0.005 | 0 | <0.005 | 0.005 | 0 |
| **Polycyclic Aromatic Hydrocarbons (PAH)** | | | | | | | | | |
| **Acenaphthene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Acenaphthylene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Anthracene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Benz(a)anthracene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Benzo(a)pyrene** | mg/L | 0.0005 | | <0.0005 | <0.0005 | 0 | <0.0005 | <0.001 | 0 |
| **Benzo(b)&(k)fluoranthene** | mg/L | 0.002 | | - | - | - | - | <0.002 | - |
| **Benzo(b)&(j)fluoranthene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | - | - |
| **Benzo(g,h,i)perylene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Benzo(k)fluoranthene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | - | - |
| **Chrysene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Dibenz(a,h)anthracene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Fluoranthene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Fluorene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Indeno(1,2,3-c,d)pyrene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Naphthalene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Phenanthrene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Pyrene** | mg/L | 0.001 | | <0.0010 | <0.0010 | 0 | <0.0010 | <0.001 | 0 |
| **Carcinogenic PAH (BaP TEQ)** | mg/L | 0.005 | | - | - | - | - | <0.005 | - |
| **Carcinogenic PAH (BaP TEQ) (lower bound)** | mg/L | 0.0005 | | <0.0005 | <0.0005 | 0 | <0.0005 | - | - |
| **Total PAHs** | mg/L | 0.0005 | | <0.0005 | <0.0005 | 0 | <0.0005 | <0.001 | 0 |
| **Other** | | | | | | | | | |
| **Carbon Dioxide** | mg/L | 1 | | 1,320 | 1,330 | 1 | 1,320 | - | - |
| **CO2 (Free)** | mg/L | 1 | | 84 | 76 | 10 | 84 | <5 | 178 |
| **pH (Lab)** | pH_Units | 0.01 | | 8.12 | 8.12 | 0 | 8.12 | - | - |
| **Total dissolved solids by calculation** | mg/L | 1 | | 3,390 | 3,260 | 4 | 3,390 | - | - |
| **Total Dissolved Solids @180°C** | mg/L | 5 | | - | - | - | - | 3,300 | - |
| **Methane** | ug/L | 10 | | <10 | <10 | 0 | <10 | - | - |
| **Sample Quality Parameters** | | | | | | | | | |
| **Electrical Conductivity @ 25°C** | uS/cm | 1 | | 5,210 | 5,020 | 4 | 5,210 | - | - |
| **Sodium** | mg/L | 0.5 | | - | - | - | - | 1,000 | - |
| **Sodium (filtered)** | mg/L | 1 | | 996 | 1,000 | 0 | 996 | - | - |
| **Potassium** | mg/L | 0.5 | | - | - | - | - | 8.1 | - |
| **Potassium (filtered)** | mg/L | 1 | | 11 | 12 | 9 | 11 | - | - |
| **Calcium** | mg/L | 0.5 | | - | - | - | - | 36 | - |
| **Calcium (filtered)** | mg/L | 1 | | 37 | 36 | 3 | 37 | - | - |
| **Magnesium** | mg/L | 0.5 | | - | - | - | - | 63 | - |
| **Magnesium (filtered)** | mg/L | 1 | | 68 | 69 | 1 | 68 | - | - |
| **Chloride** | mg/L | 1 | | 851 | 854 | 0 | 851 | 750 | 13 |
| **Sulphate (as SO4)** | mg/L | 1 | | - | - | - | - | 280 | - |
| **Sulphate (as SO4) (filtered)** | mg/L | 1 | | 279 | 267 | 4 | 279 | 280 | 0 |
| **Bicarbonate Alkalinity (as CaCO3)** | mg/L | 1 | | 1,400 | 1,420 | 1 | 1,400 | 1,400 | 0 |
| **Carbonate Alkalinity (as CaCO3)** | mg/L | 1 | | <1 | <1 | 0 | <1 | <5 | 0 |
| **Hydroxide Alkalinity (as CaCO3)** | mg/L | 1 | | <1 | <1 | 0 | <1 | <5 | 0 |
| **Total Alkalinity (as CaCO3)** | mg/L | 1 | | 1,400 | 1,420 | 1 | 1,400 | 1,400 | 0 |
| **Nitrate (as N)** | mg/L | 0.01 | | 0.04 | 0.04 | 0 | 0.04 | - | - |
| **Nitrate (as N) (filtered)** | mg/L | 0.005 | | - | - | - | - | 0.021 | - |
| **Fluoride** | mg/L | 0.1 | | 2.7 | 3.0 | 11 | 2.7 | - | - |
| **Total Anions** | meq/L | 0.01 | | 57.8 | 58.0 | 0 | 57.8 | - | - |
| **Total Cations** | meq/L | 0.01 | | 51.0 | 51.3 | 1 | 51.0 | - | - |
| **Ionic Balance (Lab)** | % | 0.01 | | 6.19 | 6.17 | 0 | 6.19 | | - |
| **Hardness (as CaCO3) (filtered)** | mg/L | 1 | | 372 | 374 | 1 | 372 | 350 | 6 |

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**Chemical Data Table**

Project number: 19131233
Project: EPA Albert Park Stage 2

**Groundwater QC Samples**

| | | | | |
|---|---|---|---|---|
| | **Field ID** | | R01 | TB01 |
| | **Sample Type** | | Rinsate | Trip Blank |
| | **Matrix Type** | | water | water |
| | **Date** | | 21/11/2019 | 21/11/2019 |
| | **Lab Report Number** | | EM1920038 | EM1920038 |
| | **Unit** | EQL | | |
| **Heavy Metals** | | | | |
| **Arsenic (filtered)** | **mg/L** | 0.001 | <0.001 | - |
| **Barium (filtered)** | **mg/L** | 0.001 | <0.001 | - |
| **Beryllium (filtered)** | **mg/L** | 0.001 | <0.001 | - |
| **Boron (filtered)** | **mg/L** | 0.05 | <0.05 | - |
| **Cadmium (filtered)** | **mg/L** | 0.0001 | <0.0001 | - |
| **Chromium (filtered)** | **mg/L** | 0.001 | <0.001 | - |
| **Cobalt (filtered)** | **mg/L** | 0.001 | <0.001 | - |
| **Copper (filtered)** | **mg/L** | 0.001 | <0.001 | - |
| **Lead (filtered)** | **mg/L** | 0.001 | <0.001 | - |
| **Manganese (filtered)** | **mg/L** | 0.001 | <0.001 | - |
| **Mercury (filtered)** | **mg/L** | 0.0001 | <0.0001 | - |
| **Nickel (filtered)** | **mg/L** | 0.001 | <0.001 | - |
| **Selenium (filtered)** | **mg/L** | 0.01 | <0.01 | - |
| **Vanadium (filtered)** | **mg/L** | 0.01 | <0.01 | - |
| **Zinc (filtered)** | **mg/L** | 0.005 | <0.005 | - |
| **Polycyclic Aromatic Hydrocarbons (PAH)** | | | | |
| **Acenaphthene** | **mg/L** | 0.001 | <0.0010 | - |
| **Acenaphthylene** | **mg/L** | 0.001 | <0.0010 | - |
| **Anthracene** | **mg/L** | 0.001 | <0.0010 | - |
| **Benz(a)anthracene** | **mg/L** | 0.001 | <0.0010 | - |
| **Benzo(a)pyrene** | **mg/L** | 0.0005 | <0.0005 | - |
| **Benzo(b)&(j)fluoranthene** | **mg/L** | 0.001 | <0.0010 | - |
| **Benzo(g,h,i)perylene** | **mg/L** | 0.001 | <0.0010 | - |
| **Benzo(k)fluoranthene** | **mg/L** | 0.001 | <0.0010 | - |
| **Chrysene** | **mg/L** | 0.001 | <0.0010 | - |
| **Dibenz(a,h)anthracene** | **mg/L** | 0.001 | <0.0010 | - |
| **Fluoranthene** | **mg/L** | 0.001 | <0.0010 | - |
| **Fluorene** | **mg/L** | 0.001 | <0.0010 | - |
| **Indeno(1,2,3-c,d)pyrene** | **mg/L** | 0.001 | <0.0010 | - |
| **Naphthalene** | **mg/L** | 0.001 | <0.0010 | <0.005 |
| **Phenanthrene** | **mg/L** | 0.001 | <0.0010 | - |
| **Pyrene** | **mg/L** | 0.001 | <0.0010 | - |
| **Carcinogenic PAH (BaP TEQ) (lower bound)** | **mg/L** | 0.0005 | <0.0005 | - |
| **Total PAHs** | **mg/L** | 0.0005 | <0.0005 | - |
| **Total Recoverable Hydrocarbons** | | | | |
| **TRH C6 - C9 Fraction** | **mg/L** | 0.02 | <0.02 | <0.02 |
| **TRH C10 - C14 Fraction** | **mg/L** | 0.05 | <0.05 | - |
| **TRH C15 - C28 Fraction** | **mg/L** | 0.1 | <0.1 | - |
| **TRH C29 - C36 Fraction** | **mg/L** | 0.05 | <0.05 | - |
| **TRH+C10 - C36 (Sum of total) (Lab Reported)** | **mg/L** | 0.05 | <0.05 | - |
| **TRH+C10 - C40 (Sum of total) (Lab Reported)** | **mg/L** | 0.1 | <0.1 | - |
| **TRH C6 - C10 Fraction F1** | **mg/L** | 0.02 | <0.02 | <0.02 |
| **TRH C6 - C10 Fraction Less BTEX F1** | **mg/L** | 0.02 | <0.02 | <0.02 |
| **TRH >C10 - C16 Fraction F2** | **mg/L** | 0.1 | <0.1 | - |
| **TRH >C10 - C16 Fraction Less Naphthalene F2** | **mg/L** | 0.1 | <0.1 | - |
| **TRH >C16 - C34 Fraction F3** | **mg/L** | 0.1 | <0.1 | - |
| **TRH >C34 - C40 Fraction F4** | **mg/L** | 0.1 | <0.1 | - |
| **BTEX** | | | | |
| **Benzene** | **mg/L** | 0.001 | <0.001 | <0.001 |
| **Toluene** | **mg/L** | 0.002 | <0.002 | <0.002 |
| **Ethylbenzene** | **mg/L** | 0.002 | <0.002 | <0.002 |
| **Xylenes (m & p)** | **mg/L** | 0.002 | <0.002 | <0.002 |
| **Xylene (o)** | **mg/L** | 0.002 | <0.002 | <0.002 |
| **Xylenes (Sum of total) (Lab Reported)** | **mg/L** | 0.002 | <0.002 | <0.002 |
| **Total BTEX** | **mg/L** | 0.001 | <0.001 | <0.001 |

**APPENDIX K**

# Laboratory Certificates of Analysis and Chain of Custody Documentation

# Chain of Custody Record

Golder Associates Pty Ltd
118 Franklin Street,

GOLDER

| | | | |
|---|---|---|---|
| **PROJECT:** | Albert Park | **DATE REQUIRED:** | Standard |
| **PROJ No.:** | 19131233 | **E-MAIL RESULTS:** | jcoley@golder.com.au |
| **SAMPLED BY:** | Josh Innes | **CC RESULTS:** | SAContaminatedLandGroup@golder.com |
| **CONTACT:** | James Coley | | |
| **LABORATORY:** | EnviroLab | **QUOTE No:** | |

| Laboratory ID | Field ID | Date Sampled | Number of Containers | Ultra-trace Halogenated Aliphatics * | TRH, BTEX, PAH | Heavy metals (13) | Major cations and anions | Natural attenuation (sulphate, nitrate, manganese, ferrous iron, | carbon dioxide | TDS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **Analyses Required X** | | | | | | | | | | |
| | DUP1B | 21/11/2019 | 12 | X | X | X | X | X | X | X | | | | |
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| | | | | | | | | | | | | | | |
| | | **Totals** | 12 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |

**Any samples heavily contaminated? No**

| | Name | Organisation | Samples Intact? | Samples Chilled? | Date | Time | Signature |
|---|---|---|---|---|---|---|---|
| RELEASED BY: | Josh Innes / James Coley | Golder Associates | *Yes* | *Yes* | 21/11/19 | *4:00PM* | |
| RECEIVED BY: | | | ***Esky Intact*** | ***Security Seals Intact*** | | | |
| | | | *Yes / No* | *Yes / No* | | | |
| RELEASED BY: | | | *Yes / No* | *Yes / No* | | | |
| RECEIVED BY: | | | ***Esky Intact*** | ***Security Seals Intact*** | | | |
| | | | *Yes / No* | *Yes / No* | | | |

***NOTE:***

*** including PCE, TCE, dichloroethene isomers and vinylchloride.**

ENVIROLAB
*Envirolab Services*
*25 Research Drive*
*Croydon South VIC 3136*
*Ph: (03) 9763 2500*

Job No: 19037

Date Received: 22/11/19

Time Received: 8:40

Received By: GS

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

8.5

# Chain of Custody Record

Golder Associates Pty Ltd
118 Franklin Street,

GOLDER

| | | | |
|---|---|---|---|
| **PROJECT:** | Albert Park | **DATE REQUIRED:** | Standard |
| **PROJ No.:** | 19131233 | **E-MAIL RESULTS:** | jcoley@golder.com.au |
| **SAMPLED BY:** | James Coley | **CC RESULTS:** | SAContaminatedLandGroup@golder.com |
| **CONTACT:** | 11 | | |
| **LABORATORY:** | Envirolab | **QUOTE No:** | |

**Analyses Required X**

| Laboratory ID | Field ID | Date Sampled | Number of Containers | TBA | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DUP1B | 21.11.19 | 12 | X | | | | | | | | | | |
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| | | | | | | | | | | | | | | |
| | | **Totals** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Any samples heavily contaminated? No**

| | Name | Organisation | Samples Intact? | Samples Chilled? | Date | Time | Signature |
|---|---|---|---|---|---|---|---|
| RELEASED BY: | Josh Innes | Golder Associates | (Yes) | (Yes) | 3:30 | 21/11/19 | |
| RECEIVED BY: | ELS Alex Stenbo | ENVIROLAB | *Esky Intact* (Yes) / No | *Security Seals Intact* (Yes) / No | 3:30 | 21/11/19 | |
| RELEASED BY: | | | Yes / No | Yes / No | | | |
| RECEIVED BY: | | | *Esky Intact* Yes / No | *Security Seals Intact* Yes / No | | | |

***NOTE:***
**COC with analysis to be sent 22/11/2019**

**Envirolab Services Pty Ltd**
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

# CERTIFICATE OF ANALYSIS 19037

## Client Details

| | |
|---|---|
| **Client** | Golder Associates Pty Ltd (Adelaide) |
| **Attention** | James Coley |
| **Address** | 118 Franklin St, Adelaide, SA, 5000 |

## Sample Details

| | |
|---|---|
| **Your Reference** | **19131288 Albert Park** |
| **Number of Samples** | 1 Water |
| **Date samples received** | 22/11/2019 |
| **Date completed instructions received** | 22/11/2019 |

## Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

## Report Details

| | |
|---|---|
| **Date results requested by** | 28/11/2019 |
| **Date of Issue** | 28/11/2019 |

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

**Results Approved By**
Chris De Luca, Operations Manager

**Authorised By**

Pamela Adams, Laboratory Manager

| VOCs in water trace level | | |
|---|---|---|
| Our Reference | | 19037-1 |
| Your Reference | UNITS | DUP1B |
| Date Sampled | | 21/11/2019 |
| Type of sample | | Water |
| Date extracted | - | 27/11/2019 |
| Date analysed | - | 27/11/2019 |
| Dichlorodifluoromethane | µg/L | <2 |
| Chloromethane | µg/L | <2 |
| Vinyl Chloride | µg/L | <0.2 |
| Bromomethane | µg/L | <2 |
| Chloroethane | µg/L | <2 |
| Trichlorofluoromethane | µg/L | <2 |
| 1,1-Dichloroethene | µg/L | <0.1 |
| Trans-1,2-dichloroethene | µg/L | 0.2 |
| 1,1-dichloroethane | µg/L | <0.1 |
| Cis-1,2-dichloroethene | µg/L | 0.8 |
| Bromochloromethane | µg/L | <0.5 |
| Chloroform | µg/L | <0.5 |
| 2,2-dichloropropane | µg/L | <0.1 |
| 1,2-dichloroethane | µg/L | <0.1 |
| 1,1,1-trichloroethane | µg/L | <0.1 |
| 1,1-dichloropropene | µg/L | <0.1 |
| Carbon tetrachloride | µg/L | <0.1 |
| Benzene | µg/L | <0.1 |
| Dibromomethane | µg/L | <0.5 |
| 1,2-dichloropropane | µg/L | <0.1 |
| Trichloroethene | µg/L | 14 |
| Bromodichloromethane | µg/L | <0.1 |
| trans-1,3-dichloropropene | µg/L | <0.1 |
| cis-1,3-dichloropropene | µg/L | <0.1 |
| 1,1,2-trichloroethane | µg/L | <0.1 |
| Toluene | µg/L | <0.1 |
| 1,3-dichloropropane | µg/L | <0.1 |
| Dibromochloromethane | µg/L | <0.1 |
| 1,2-dibromoethane | µg/L | <0.1 |
| Tetrachloroethene | µg/L | <0.1 |
| 1,1,1,2-tetrachloroethane | µg/L | <0.1 |
| Chlorobenzene | µg/L | <0.1 |
| Ethylbenzene | µg/L | <0.1 |

| VOCs in water trace level | | |
|---|---|---|
| Our Reference | | 19037-1 |
| Your Reference | UNITS | DUP1B |
| Date Sampled | | 21/11/2019 |
| Type of sample | | Water |
| m+p-xylene | µg/L | <0.2 |
| Styrene | µg/L | <0.1 |
| 1,1,2,2-tetrachloroethane | µg/L | <0.1 |
| o-xylene | µg/L | <0.1 |
| 1,2,3-trichloropropane | µg/L | <0.1 |
| Isopropylbenzene | µg/L | <0.1 |
| Bromobenzene | µg/L | <0.1 |
| n-propyl benzene | µg/L | <0.1 |
| 2-chlorotoluene | µg/L | <0.1 |
| 4-chlorotoluene | µg/L | <0.1 |
| 1,3,5-trimethyl benzene | µg/L | <0.1 |
| Tert-butyl benzene | µg/L | <0.1 |
| 1,2,4-trimethyl benzene | µg/L | <0.1 |
| 1,3-dichlorobenzene | µg/L | <0.1 |
| Sec-butyl benzene | µg/L | <0.1 |
| 1,4-dichlorobenzene | µg/L | <0.1 |
| 4-isopropyl toluene | µg/L | <0.1 |
| 1,2-dichlorobenzene | µg/L | <0.1 |
| n-butyl benzene | µg/L | <0.1 |
| 1,2-dibromo-3-chloropropane | µg/L | <0.1 |
| 1,2,4-trichlorobenzene | µg/L | <0.1 |
| Hexachlorobutadiene | µg/L | <0.2 |
| 1,2,3-trichlorobenzene | µg/L | <0.1 |
| *Surrogate* Dibromofluoromethane | % | 74 |
| *Surrogate* toluene-d8 | % | 102 |

| vTRH(C6-C10)/BTEXN in Water | | |
|---|---|---|
| Our Reference | | 19037-1 |
| Your Reference | UNITS | DUP1B |
| Date Sampled | | 21/11/2019 |
| Type of sample | | Water |
| Date extracted | - | 27/11/2019 |
| Date analysed | - | 27/11/2019 |
| TRH $C_6$ - $C_9$ | µg/L | 23 |
| TRH $C_6$ - $C_{10}$ | µg/L | 25 |
| TRH $C_6$ - $C_{10}$ less BTEX (F1) | µg/L | 25 |
| Benzene | µg/L | <1 |
| Toluene | µg/L | <1 |
| Ethylbenzene | µg/L | <1 |
| m+p-xylene | µg/L | <2 |
| o-xylene | µg/L | <1 |
| Naphthalene | µg/L | <1 |
| Total +ve Xylenes | µg/L | <1 |
| *Surrogate* Dibromofluoromethane | % | 84 |
| *Surrogate* toluene-d8 | % | 104 |
| *Surrogate* 4-BFB | % | 104 |

| TRH Water(C10-C40) NEPM | | |
|---|---|---|
| Our Reference | | 19037-1 |
| Your Reference | UNITS | DUP1B |
| Date Sampled | | 21/11/2019 |
| Type of sample | | Water |
| Date extracted | - | 25/11/2019 |
| Date analysed | - | 25/11/2019 |
| TRH $C_{10}$ - $C_{14}$ | µg/L | <50 |
| TRH $C_{15}$ - $C_{28}$ | µg/L | <100 |
| TRH $C_{29}$ - $C_{36}$ | µg/L | <100 |
| Total +ve TRH (C10-C36) | µg/L | <50 |
| TRH >$C_{10}$ - $C_{16}$ | µg/L | <50 |
| TRH >$C_{10}$ - $C_{16}$ less Naphthalene (F2) | µg/L | <50 |
| TRH >$C_{16}$ - $C_{34}$ | µg/L | <100 |
| TRH >$C_{34}$ - $C_{40}$ | µg/L | <100 |
| Total +ve TRH (>C10-C40) | µg/L | <50 |
| *Surrogate* o-Terphenyl | % | 98 |

| PAHs in Water | | |
|---|---|---|
| Our Reference | | 19037-1 |
| Your Reference | UNITS | DUP1B |
| Date Sampled | | 21/11/2019 |
| Type of sample | | Water |
| Date extracted | - | 25/11/2019 |
| Date analysed | - | 25/11/2019 |
| Naphthalene | µg/L | <1 |
| Acenaphthylene | µg/L | <1 |
| Acenaphthene | µg/L | <1 |
| Fluorene | µg/L | <1 |
| Phenanthrene | µg/L | <1 |
| Anthracene | µg/L | <1 |
| Fluoranthene | µg/L | <1 |
| Pyrene | µg/L | <1 |
| Benzo(a)anthracene | µg/L | <1 |
| Chrysene | µg/L | <1 |
| Benzo(b,j&k)fluoranthene | µg/L | <2 |
| Benzo(a)pyrene | µg/L | <1 |
| Indeno(1,2,3-c,d)pyrene | µg/L | <1 |
| Dibenzo(a,h)anthracene | µg/L | <1 |
| Benzo(g,h,i)perylene | µg/L | <1 |
| Total +ve PAH's | µg/L | <1 |
| Benzo(a)pyrene TEQ | µg/L | <5 |

| HM in water - dissolved | | |
|---|---|---|
| Our Reference | | 19037-1 |
| Your Reference | UNITS | DUP1B |
| Date Sampled | | 21/11/2019 |
| Type of sample | | Water |
| Date prepared | - | 22/11/2019 |
| Date analysed | - | 22/11/2019 |
| Arsenic-Dissolved | µg/L | <1 |
| Cadmium-Dissolved | µg/L | <0.1 |
| Chromium-Dissolved | µg/L | <1 |
| Copper-Dissolved | µg/L | <1 |
| Lead-Dissolved | µg/L | <1 |
| Nickel-Dissolved | µg/L | <1 |
| Zinc-Dissolved | µg/L | 5 |
| Mercury-Dissolved | µg/L | <0.05 |
| Manganese-Dissolved | µg/L | <5 |
| Barium-Dissolved | µg/L | 74 |
| Beryllium-Dissolved | µg/L | <0.5 |
| Cobalt-Dissolved | µg/L | <1 |
| | | 7 |

| Miscellaneous Inorganics | | |
|---|---|---|
| Our Reference | | 19037-1 |
| Your Reference | UNITS | DUP1B |
| Date Sampled | | 21/11/2019 |
| Type of sample | | Water |
| Date prepared | - | 22/11/2019 |
| Date analysed | - | 22/11/2019 |
| Total Dissolved Solids (grav) | mg/L | 3,300 |
| Nitrate as N in water | mg/L | 0.021 |
| Ferrous Iron | mg/L | <0.05 |
| Sulphate, SO4 | mg/L | 280 |
| Carbon Dioxide $CO_2$ | mg/L | <5 |

| Ion Balance | | |
|---|---|---|
| Our Reference | | 19037-1 |
| Your Reference | UNITS | DUP1B |
| Date Sampled | | 21/11/2019 |
| Type of sample | | Water |
| Date prepared | - | 25/11/2019 |
| Date analysed | - | 25/11/2019 |
| Calcium - Dissolved | mg/L | 36 |
| Potassium - Dissolved | mg/L | 8.1 |
| Sodium - Dissolved | mg/L | 1,000 |
| Magnesium - Dissolved | mg/L | 63 |
| Hydroxide Alkalinity ($OH^-$) as $CaCO_3$ | mg/L | <5 |
| Bicarbonate Alkalinity as $CaCO_3$ | mg/L | 1,400 |
| Carbonate Alkalinity as $CaCO_3$ | mg/L | <5 |
| Total Alkalinity as $CaCO_3$ | mg/L | 1,400 |
| Sulphate, SO4 | mg/L | 280 |
| Chloride, Cl | mg/L | 750 |
| Hardness | mgCaCO 3 /L | 350 |
| Ionic Balance | % | -3.1 |

| Method ID | Methodology Summary |
|---|---|
| **APHA 4500-CO2** | $CO_2$ -determined titrimetrically . Based on latest edition of APHA, 4500-$CO_2$ C. |
| **Inorg-006** | Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B. |
| **Inorg-018** | Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10oC. |
| **Inorg-040** | The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 10% ie total anions = total cations +/-10%. |
| **Inorg-055** | Nitrate - determined colourimetrically. Soils are analysed following a water extraction. Water samples are filtered on receipt prior to analysis. |
| **Inorg-076** | A sample is determined colourimetrically by discrete analyser as referenced in APHA 3500 Fe-B (phenanthroline method). Water samples are filtered on receipt prior to analysis. |
| **Inorg-081** | Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110-B. Water samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser. |
| **Inorg-115** | Sulphate by turbidity using Discrete Analyser |
| **Metals-020 ICP-AES** | Determination of various metals by ICP-AES. |
| **Metals-021 CV-AAS** | Determination of Mercury by Cold Vapour AAS. |
| **Metals-022 ICP-MS** | Determination of various metals by ICP-MS. |
| **Org-003** | Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.<br><br>F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.<br><br>Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40). |
| **Org-012** | Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater 2013. |
| **Org-013** | Water samples are analysed directly by purge and trap GC-MS. |
| **Org-016** | Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.<br>Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes. |

| QUALITY CONTROL: VOCs in water trace level | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date extracted | - | | | 27/11/2019 | [NT] | [NT] | [NT] | [NT] | 27/11/2019 | [NT] |
| Date analysed | - | | | 27/11/2019 | [NT] | [NT] | [NT] | [NT] | 27/11/2019 | [NT] |
| Dichlorodifluoromethane | µg/L | 2 | Org-013 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Chloromethane | µg/L | 2 | Org-013 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Vinyl Chloride | µg/L | 0.2 | Org-013 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Bromomethane | µg/L | 2 | Org-013 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Chloroethane | µg/L | 2 | Org-013 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Trichlorofluoromethane | µg/L | 2 | Org-013 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,1-Dichloroethene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Trans-1,2-dichloroethene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,1-dichloroethane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | 123 | [NT] |
| Cis-1,2-dichloroethene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Bromochloromethane | µg/L | 0.5 | Org-013 | <0.5 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Chloroform | µg/L | 0.5 | Org-013 | <0.5 | [NT] | [NT] | [NT] | [NT] | 83 | [NT] |
| 2,2-dichloropropane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,2-dichloroethane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | 82 | [NT] |
| 1,1,1-trichloroethane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | 80 | [NT] |
| 1,1-dichloropropene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Carbon tetrachloride | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Benzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Dibromomethane | µg/L | 0.5 | Org-013 | <0.5 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,2-dichloropropane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Trichloroethene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | 84 | [NT] |
| Bromodichloromethane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | 123 | [NT] |
| trans-1,3-dichloropropene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| cis-1,3-dichloropropene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,1,2-trichloroethane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Toluene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,3-dichloropropane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Dibromochloromethane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | 82 | [NT] |
| 1,2-dibromoethane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Tetrachloroethene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | 101 | [NT] |
| 1,1,1,2-tetrachloroethane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Chlorobenzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Ethylbenzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Bromoform | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| m+p-xylene | µg/L | 0.2 | Org-013 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Styrene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,1,2,2-tetrachloroethane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| o-xylene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |

| QUALITY CONTROL: VOCs in water trace level | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| 1,2,3-trichloropropane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Isopropylbenzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Bromobenzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| n-propyl benzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 2-chlorotoluene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 4-chlorotoluene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,3,5-trimethyl benzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Tert-butyl benzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,2,4-trimethyl benzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,3-dichlorobenzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Sec-butyl benzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,4-dichlorobenzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 4-isopropyl toluene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,2-dichlorobenzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| n-butyl benzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,2-dibromo-3-chloropropane | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,2,4-trichlorobenzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Hexachlorobutadiene | µg/L | 0.2 | Org-013 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| 1,2,3-trichlorobenzene | µg/L | 0.1 | Org-013 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate* Dibromofluoromethane | % | | Org-013 | 75 | [NT] | [NT] | [NT] | [NT] | 82 | [NT] |
| *Surrogate* toluene-d8 | % | | Org-013 | 101 | [NT] | [NT] | [NT] | [NT] | 111 | [NT] |
| *Surrogate* 4-BFB | % | | Org-013 | 98 | [NT] | [NT] | [NT] | [NT] | 101 | [NT] |

| QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date extracted | - | | | 27/11/2019 | [NT] | [NT] | [NT] | [NT] | 27/11/2019 | [NT] |
| Date analysed | - | | | 27/11/2019 | [NT] | [NT] | [NT] | [NT] | 27/11/2019 | [NT] |
| TRH $C_6$ - $C_9$ | µg/L | 10 | Org-016 | <10 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| TRH $C_6$ - $C_{10}$ | µg/L | 10 | Org-016 | <10 | [NT] | [NT] | [NT] | [NT] | 99 | [NT] |
| Benzene | µg/L | 1 | Org-016 | <1 | [NT] | [NT] | [NT] | [NT] | 89 | [NT] |
| Toluene | µg/L | 1 | Org-016 | <1 | [NT] | [NT] | [NT] | [NT] | 106 | [NT] |
| Ethylbenzene | µg/L | 1 | Org-016 | <1 | [NT] | [NT] | [NT] | [NT] | 95 | [NT] |
| m+p-xylene | µg/L | 2 | Org-016 | <2 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| o-xylene | µg/L | 1 | Org-016 | <1 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Naphthalene | µg/L | 1 | Org-013 | <1 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| *Surrogate* Dibromofluoromethane | % | | Org-016 | 90 | [NT] | [NT] | [NT] | [NT] | 94 | [NT] |
| *Surrogate* toluene-d8 | % | | Org-016 | 104 | [NT] | [NT] | [NT] | [NT] | 111 | [NT] |
| *Surrogate* 4-BFB | % | | Org-016 | 105 | [NT] | [NT] | [NT] | [NT] | 107 | [NT] |

| QUALITY CONTROL: TRH Water(C10-C40) NEPM | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date extracted | - | | | 25/11/2019 | [NT] | [NT] | [NT] | [NT] | 25/11/2019 | [NT] |
| Date analysed | - | | | 25/11/2019 | [NT] | [NT] | [NT] | [NT] | 25/11/2019 | [NT] |
| TRH $C_{10}$ - $C_{14}$ | µg/L | 50 | Org-003 | <50 | [NT] | [NT] | [NT] | [NT] | 87 | [NT] |
| TRH $C_{15}$ - $C_{28}$ | µg/L | 100 | Org-003 | <100 | [NT] | [NT] | [NT] | [NT] | 113 | [NT] |
| TRH $C_{29}$ - $C_{36}$ | µg/L | 100 | Org-003 | <100 | [NT] | [NT] | [NT] | [NT] | 133 | [NT] |
| TRH >$C_{10}$ - $C_{16}$ | µg/L | 50 | Org-003 | <50 | [NT] | [NT] | [NT] | [NT] | 87 | [NT] |
| TRH >$C_{16}$ - $C_{34}$ | µg/L | 100 | Org-003 | <100 | [NT] | [NT] | [NT] | [NT] | 113 | [NT] |
| TRH >$C_{34}$ - $C_{40}$ | µg/L | 100 | Org-003 | <100 | [NT] | [NT] | [NT] | [NT] | 133 | [NT] |
| *Surrogate* o-Terphenyl | % | | Org-003 | 101 | [NT] | [NT] | [NT] | [NT] | 92 | [NT] |

| QUALITY CONTROL: PAHs in Water | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date extracted | - | | | 25/11/2019 | [NT] | [NT] | [NT] | [NT] | 25/11/2019 | [NT] |
| Date analysed | - | | | 25/11/2019 | [NT] | [NT] | [NT] | [NT] | 25/11/2019 | [NT] |
| Naphthalene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | 68 | [NT] |
| Acenaphthylene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | 92 | [NT] |
| Acenaphthene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Fluorene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | 108 | [NT] |
| Phenanthrene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | 102 | [NT] |
| Anthracene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Fluoranthene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | 118 | [NT] |
| Pyrene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | 110 | [NT] |
| Benzo(a)anthracene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Chrysene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | 130 | [NT] |
| Benzo(b,j&k)fluoranthene | µg/L | 2 | Org-012 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Benzo(a)pyrene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | 132 | [NT] |
| Indeno(1,2,3-c,d)pyrene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Dibenzo(a,h)anthracene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Benzo(g,h,i)perylene | µg/L | 1 | Org-012 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate p*-Terphenyl-$d_{14}$ | % | | Org-012 | 100 | [NT] | [NT] | [NT] | [NT] | 102 | [NT] |

| QUALITY CONTROL: HM in water - dissolved | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date prepared | - | | | 22/11/2019 | 1 | 22/11/2019 | 22/11/2019 | | 22/11/2019 | [NT] |
| Date analysed | - | | | 22/11/2019 | 1 | 22/11/2019 | 22/11/2019 | | 22/11/2019 | [NT] |
| Arsenic-Dissolved | µg/L | 1 | Metals-022 ICP-MS | <1 | 1 | <1 | <1 | 0 | 101 | [NT] |
| Cadmium-Dissolved | µg/L | 0.1 | Metals-022 ICP-MS | <0.1 | 1 | <0.1 | <0.1 | 0 | 101 | [NT] |
| Chromium-Dissolved | µg/L | 1 | Metals-022 ICP-MS | <1 | 1 | <1 | <1 | 0 | 105 | [NT] |
| Copper-Dissolved | µg/L | 1 | Metals-022 ICP-MS | <1 | 1 | <1 | <1 | 0 | 102 | [NT] |
| Lead-Dissolved | µg/L | 1 | Metals-022 ICP-MS | <1 | 1 | <1 | <1 | 0 | 98 | [NT] |
| Nickel-Dissolved | µg/L | 1 | Metals-022 ICP-MS | <1 | 1 | <1 | <1 | 0 | 103 | [NT] |
| Zinc-Dissolved | µg/L | 1 | Metals-022 ICP-MS | <1 | 1 | 5 | 3 | 50 | 103 | [NT] |
| Mercury-Dissolved | µg/L | 0.05 | Metals-021 CV-AAS | <0.05 | 1 | <0.05 | <0.05 | 0 | 95 | [NT] |
| Manganese-Dissolved | µg/L | 5 | Metals-022 ICP-MS | <5 | 1 | <5 | <5 | 0 | 105 | [NT] |
| Barium-Dissolved | µg/L | 1 | Metals-022 ICP-MS | <1 | 1 | 74 | 73 | 1 | 102 | [NT] |
| Beryllium-Dissolved | µg/L | 0.5 | Metals-022 ICP-MS | <0.5 | 1 | <0.5 | <0.5 | 0 | 92 | [NT] |
| Cobalt-Dissolved | µg/L | 1 | Metals-022 ICP-MS | <1 | 1 | <1 | <1 | 0 | 100 | [NT] |
| Selenium-Dissolved | µg/L | 1 | Metals-022 ICP-MS | <1 | 1 | 7 | 7 | 0 | 96 | [NT] |

| QUALITY CONTROL: Miscellaneous Inorganics | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date prepared | - | | | 22/11/2019 | [NT] | [NT] | [NT] | [NT] | 22/11/2019 | [NT] |
| Date analysed | - | | | 22/11/2019 | [NT] | [NT] | [NT] | [NT] | 22/11/2019 | [NT] |
| Total Dissolved Solids (grav) | mg/L | 5 | Inorg-018 | <5 | [NT] | [NT] | [NT] | [NT] | 101 | [NT] |
| Nitrate as N in water | mg/L | 0.005 | Inorg-055 | <0.005 | [NT] | [NT] | [NT] | [NT] | 102 | [NT] |
| Ferrous Iron | mg/L | 0.05 | Inorg-076 | <0.05 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Sulphate, SO4 | mg/L | 1 | Inorg-115 | <1 | [NT] | [NT] | [NT] | [NT] | 115 | [NT] |

| QUALITY CONTROL: Ion Balance | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date prepared | - | | | 25/11/2019 | [NT] | [NT] | [NT] | [NT] | 25/11/2019 | [NT] |
| Date analysed | - | | | 25/11/2019 | [NT] | [NT] | [NT] | [NT] | 25/11/2019 | [NT] |
| Calcium - Dissolved | mg/L | 0.5 | Metals-020 ICP-AES | <0.5 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Potassium - Dissolved | mg/L | 0.5 | Metals-020 ICP-AES | <0.5 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| Sodium - Dissolved | mg/L | 0.5 | Metals-020 ICP-AES | <0.5 | [NT] | [NT] | [NT] | [NT] | 96 | [NT] |
| Magnesium - Dissolved | mg/L | 0.5 | Metals-020 ICP-AES | <0.5 | [NT] | [NT] | [NT] | [NT] | 95 | [NT] |
| Hydroxide Alkalinity ($OH^-$) as $CaCO_3$ | mg/L | 5 | Inorg-006 | <5 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Bicarbonate Alkalinity as $CaCO_3$ | mg/L | 5 | Inorg-006 | <5 | [NT] | [NT] | [NT] | [NT] | 106 | [NT] |
| Carbonate Alkalinity as $CaCO_3$ | mg/L | 5 | Inorg-006 | <5 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Total Alkalinity as $CaCO_3$ | mg/L | 5 | Inorg-006 | <5 | [NT] | [NT] | [NT] | [NT] | 106 | [NT] |
| Sulphate, SO4 | mg/L | 1 | Inorg-081 | <1 | [NT] | [NT] | [NT] | [NT] | 115 | [NT] |
| Chloride, Cl | mg/L | 1 | Inorg-081 | <1 | [NT] | [NT] | [NT] | [NT] | 113 | [NT] |

## Result Definitions

| | |
|---|---|
| **NT** | Not tested |
| **NA** | Test not required |
| **INS** | Insufficient sample for this test |
| **PQL** | Practical Quantitation Limit |
| **<** | Less than |
| **>** | Greater than |
| **RPD** | Relative Percent Difference |
| **LCS** | Laboratory Control Sample |
| **NS** | Not specified |
| **NEPM** | National Environmental Protection Measure |
| **NR** | Not Reported |

## Quality Control Definitions

| | |
|---|---|
| **Blank** | This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples. |
| **Duplicate** | This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable. |
| **Matrix Spike** | A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist. |
| **LCS (Laboratory Control Sample)** | This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample. |
| **Surrogate Spike** | Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples. |

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

## Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

**Envirolab Services Pty Ltd**
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

# CERTIFICATE OF ANALYSIS 230172

## Client Details

| | |
|---|---|
| **Client** | Golder Associates Pty Ltd (Adelaide) |
| **Attention** | James Coley |
| **Address** | 118 Franklin St, Adelaide, SA, 5000 |

## Sample Details

| | |
|---|---|
| **Your Reference** | **19131233 EPA - Albert Park** |
| **Number of Samples** | 16xCanister |
| **Date samples received** | 06/11/2019 |
| **Date completed instructions received** | 06/11/2019 |

## Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

**Please refer to the last page of this report for any comments relating to the results.**

## Report Details

| | |
|---|---|
| **Date results requested by** | 13/11/2019 |
| **Date of Issue** | 12/11/2019 |

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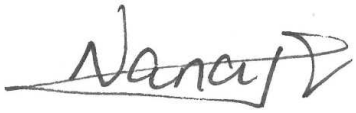
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

**Results Approved By**
Chris Guo, Senior Chemist, Air

**Authorised By**



Nancy Zhang, Laboratory Manager

| TO15 Chlorinated in Cans ppbv | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 230172-1 | 230172-2 | 230172-3 | 230172-4 | 230172-5 |
| Your Reference | UNITS | SV01-D | SV01-S | SV02 | SV03-D | SV03-S |
| Date Sampled | | 04/11/2019 | 04/11/2019 | 04/11/2019 | 04/11/2019 | 04/11/2019 |
| Type of sample | | Canister | Canister | Canister | Canister | Canister |
| Air Kit Security No. | | 2462 | 3299 | 2259 | 1872 | 3655 |
| Vacuum before Shipment | Hg" | -30 | -30 | -30 | -30 | -30 |
| Vacuum before Analysis | Hg" | -6 | -6 | -7 | -8 | -7 |
| Date prepared | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Date analysed | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Vinyl chloride | ppbv | <3 | <1.5 | <0.6 | <3 | <1.5 |
| Trichloroethene | ppbv | 6,000 | 2,100 | 1,500 | 7,700 | 3,400 |
| 1,1-Dichloroethene | ppbv | <5 | <2.5 | <1 | <5 | <2.5 |
| trans-1,2-dichloroethene | ppbv | <5 | <2.5 | 17 | 8.4 | <2.5 |
| cis-1,2-Dichloroethene | ppbv | 95 | 6.8 | 6.2 | 69 | 23 |
| Tetrachloroethene | ppbv | 87 | 35 | 18 | 20 | 8.9 |
| *Surrogate*-Bromochloromethane | % rec | 101 | 100 | 105 | 101 | 101 |
| *Surrogate* -1,4-Difluorobenzene | % rec | 99 | 100 | 100 | 99 | 99 |
| *Surrogate*-Chlorobenzene-D5 | % rec | 95 | 96 | 96 | 94 | 93 |

| TO15 Chlorinated in Cans ppbv | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 230172-6 | 230172-7 | 230172-8 | 230172-9 | 230172-10 |
| Your Reference | UNITS | SV06 | SV11 | SV12 | SV13 | SV13-R |
| Date Sampled | | 04/11/2019 | 04/11/2019 | 04/11/2019 | 05/11/2019 | 05/11/2019 |
| Type of sample | | Canister | Canister | Canister | Canister | Canister |
| Air Kit Security No. | | 1697 | 2460 | 3644 | 3510 | 1699 |
| Vacuum before Shipment | Hg" | -30 | -30 | -30 | -30 | -30 |
| Vacuum before Analysis | Hg" | -8 | -7 | -6 | -8 | -7 |
| Date prepared | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Date analysed | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Vinyl chloride | ppbv | <0.3 | <0.3 | <0.3 | <0.3 | <0.3 |
| Trichloroethene | ppbv | 72 | 4.5 | 48 | 140 | 150 |
| 1,1-Dichloroethene | ppbv | <0.5 | 9.3 | <0.5 | <0.5 | <0.5 |
| trans-1,2-dichloroethene | ppbv | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| cis-1,2-Dichloroethene | ppbv | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Tetrachloroethene | ppbv | 10 | 12 | 31 | 2 | 2 |
| *Surrogate*-Bromochloromethane | % rec | 97 | 101 | 97 | 102 | 98 |
| *Surrogate* -1,4-Difluorobenzene | % rec | 101 | 92 | 91 | 92 | 90 |
| *Surrogate*-Chlorobenzene-D5 | % rec | 97 | 88 | 88 | 87 | 87 |

| TO15 Chlorinated in Cans ppbv | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 230172-11 | 230172-12 | 230172-13 | 230172-14 | 230172-15 |
| Your Reference | UNITS | SV14 | SV15 | SV16 | SV17 | SV18 |
| Date Sampled | | 05/11/2019 | 05/11/2019 | 05/11/2019 | 05/11/2019 | 05/11/2019 |
| Type of sample | | Canister | Canister | Canister | Canister | Canister |
| Air Kit Security No. | | 2289 | 2284 | 2273 | 2467 | 2283 |
| Vacuum before Shipment | Hg" | -30 | -30 | -30 | -30 | -30 |
| Vacuum before Analysis | Hg" | -6 | -8 | -8 | -8 | -8 |
| Date prepared | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Date analysed | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Vinyl chloride | ppbv | <0.3 | <0.3 | <0.3 | <0.3 | <0.3 |
| Trichloroethene | ppbv | 730 | 7.0 | 29 | <0.3 | 47 |
| 1,1-Dichloroethene | ppbv | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| trans-1,2-dichloroethene | ppbv | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| cis-1,2-Dichloroethene | ppbv | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Tetrachloroethene | ppbv | 21 | 3 | 1 | <0.5 | 0.8 |
| *Surrogate*-Bromochloromethane | % rec | 96 | 96 | 95 | 96 | 92 |
| *Surrogate* -1,4-Difluorobenzene | % rec | 89 | 89 | 88 | 88 | 88 |
| *Surrogate*-Chlorobenzene-D5 | % rec | 88 | 85 | 84 | 84 | 84 |

| TO15 Chlorinated in Cans ppbv | | |
|---|---|---|
| Our Reference | | 230172-16 |
| Your Reference | UNITS | SV19 |
| Date Sampled | | 05/11/2019 |
| Type of sample | | Canister |
| Air Kit Security No. | | 3639 |
| Vacuum before Shipment | Hg" | -30 |
| Vacuum before Analysis | Hg" | -7 |
| Date prepared | - | 08/11/2019 |
| Date analysed | - | 08/11/2019 |
| Vinyl chloride | ppbv | <0.3 |
| Trichloroethene | ppbv | 34 |
| 1,1-Dichloroethene | ppbv | <0.5 |
| trans-1,2-dichloroethene | ppbv | <0.5 |
| cis-1,2-Dichloroethene | ppbv | <0.5 |
| Tetrachloroethene | ppbv | 2 |
| *Surrogate*-Bromochloromethane | % rec | 95 |
| *Surrogate* -1,4-Difluorobenzene | % rec | 89 |
| *Surrogate*-Chlorobenzene-D5 | % rec | 83 |

| TO15 chlorinated in Cans ug/m3 | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 230172-1 | 230172-2 | 230172-3 | 230172-4 | 230172-5 |
| Your Reference | UNITS | SV01-D | SV01-S | SV02 | SV03-D | SV03-S |
| Date Sampled | | 04/11/2019 | 04/11/2019 | 04/11/2019 | 04/11/2019 | 04/11/2019 |
| Type of sample | | Canister | Canister | Canister | Canister | Canister |
| Air Kit Security No. | | 2462 | 3299 | 2259 | 1872 | 3655 |
| Vacuum before Shipment | Hg" | -30 | -30 | -30 | -30 | -30 |
| Vacuum before Analysis | Hg" | -6 | -6 | -7 | -8 | -7 |
| Date prepared | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Date analysed | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Vinyl chloride | µg/m³ | <7.7 | <3.8 | <1.5 | <7.7 | <3.8 |
| Trichloroethene | µg/m³ | 32,000 | 11,000 | 8,300 | 42,000 | 18,000 |
| 1,1-Dichloroethene | µg/m³ | <20 | <9.9 | <4 | <20 | <9.9 |
| trans-1,2-dichloroethene | µg/m³ | <20 | <9.9 | 68 | 33 | <9.9 |
| cis-1,2-Dichloroethene | µg/m³ | 380 | 27 | 25 | 270 | 90 |
| Tetrachloroethene | µg/m³ | 590 | 240 | 120 | 130 | 60 |
| *Surrogate*-Bromochloromethane | % rec | 101 | 100 | 105 | 101 | 101 |
| *Surrogate* -1,4-Difluorobenzene | % rec | 99 | 100 | 100 | 99 | 99 |
| *Surrogate*-Chlorobenzene-D5 | % rec | 95 | 96 | 96 | 94 | 93 |

| TO15 chlorinated in Cans ug/m3 | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 230172-6 | 230172-7 | 230172-8 | 230172-9 | 230172-10 |
| Your Reference | UNITS | SV06 | SV11 | SV12 | SV13 | SV13-R |
| Date Sampled | | 04/11/2019 | 04/11/2019 | 04/11/2019 | 05/11/2019 | 05/11/2019 |
| Type of sample | | Canister | Canister | Canister | Canister | Canister |
| Air Kit Security No. | | 1697 | 2460 | 3644 | 3510 | 1699 |
| Vacuum before Shipment | Hg" | -30 | -30 | -30 | -30 | -30 |
| Vacuum before Analysis | Hg" | -8 | -7 | -6 | -8 | -7 |
| Date prepared | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Date analysed | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Vinyl chloride | µg/m³ | <0.8 | <0.8 | <0.8 | <0.8 | <0.8 |
| Trichloroethene | µg/m³ | 390 | 24 | 260 | 750 | 810 |
| 1,1-Dichloroethene | µg/m³ | <2 | 37 | <2 | <2 | <2 |
| trans-1,2-dichloroethene | µg/m³ | <2 | <2 | <2 | <2 | <2 |
| cis-1,2-Dichloroethene | µg/m³ | <2 | <2 | <2 | <2 | <2 |
| Tetrachloroethene | µg/m³ | 68 | 80 | 210 | 10 | 10 |
| *Surrogate*-Bromochloromethane | % rec | 97 | 101 | 97 | 102 | 98 |
| *Surrogate* -1,4-Difluorobenzene | % rec | 101 | 92 | 91 | 92 | 90 |
| *Surrogate*-Chlorobenzene-D5 | % rec | 97 | 88 | 88 | 87 | 87 |

| TO15 chlorinated in Cans ug/m3 | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 230172-11 | 230172-12 | 230172-13 | 230172-14 | 230172-15 |
| Your Reference | UNITS | SV14 | SV15 | SV16 | SV17 | SV18 |
| Date Sampled | | 05/11/2019 | 05/11/2019 | 05/11/2019 | 05/11/2019 | 05/11/2019 |
| Type of sample | | Canister | Canister | Canister | Canister | Canister |
| Air Kit Security No. | | 2289 | 2284 | 2273 | 2467 | 2283 |
| Vacuum before Shipment | Hg" | -30 | -30 | -30 | -30 | -30 |
| Vacuum before Analysis | Hg" | -6 | -8 | -8 | -8 | -8 |
| Date prepared | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Date analysed | - | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 | 08/11/2019 |
| Vinyl chloride | µg/m³ | <0.8 | <0.8 | <0.8 | <0.8 | <0.8 |
| Trichloroethene | µg/m³ | 3,900 | 38 | 160 | <1.6 | 250 |
| 1,1-Dichloroethene | µg/m³ | <2 | <2 | <2 | <2 | <2 |
| trans-1,2-dichloroethene | µg/m³ | <2 | <2 | <2 | <2 | <2 |
| cis-1,2-Dichloroethene | µg/m³ | <2 | <2 | <2 | <2 | <2 |
| Tetrachloroethene | µg/m³ | 140 | 20 | 7 | <3.4 | 6 |
| *Surrogate*-Bromochloromethane | % rec | 96 | 96 | 95 | 96 | 92 |
| *Surrogate* -1,4-Difluorobenzene | % rec | 89 | 89 | 88 | 88 | 88 |
| *Surrogate*-Chlorobenzene-D5 | % rec | 88 | 85 | 84 | 84 | 84 |

| TO15 chlorinated in Cans ug/m3 | | |
|---|---|---|
| Our Reference | | 230172-16 |
| Your Reference | UNITS | SV19 |
| Date Sampled | | 05/11/2019 |
| Type of sample | | Canister |
| Air Kit Security No. | | 3639 |
| Vacuum before Shipment | Hg" | -30 |
| Vacuum before Analysis | Hg" | -7 |
| Date prepared | - | 08/11/2019 |
| Date analysed | - | 08/11/2019 |
| Vinyl chloride | µg/m³ | <0.8 |
| Trichloroethene | µg/m³ | 180 |
| 1,1-Dichloroethene | µg/m³ | <2 |
| trans-1,2-dichloroethene | µg/m³ | <2 |
| cis-1,2-Dichloroethene | µg/m³ | <2 |
| Tetrachloroethene | µg/m³ | 10 |
| *Surrogate*-Bromochloromethane | % rec | 95 |
| *Surrogate* -1,4-Difluorobenzene | % rec | 89 |
| *Surrogate*-Chlorobenzene-D5 | % rec | 83 |

| Permanent Gas analysis | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 230172-1 | 230172-2 | 230172-3 | 230172-4 | 230172-5 |
| Your Reference | UNITS | SV01-D | SV01-S | SV02 | SV03-D | SV03-S |
| Date Sampled | | 04/11/2019 | 04/11/2019 | 04/11/2019 | 04/11/2019 | 04/11/2019 |
| Type of sample | | Canister | Canister | Canister | Canister | Canister |
| Air Kit Security No. | | 2462 | 3299 | 2259 | 1872 | 3655 |
| Date prepared | - | 07/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 |
| Date analysed | - | 07/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 |
| Helium (He) | % | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |

| Permanent Gas analysis | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 230172-6 | 230172-7 | 230172-8 | 230172-9 | 230172-10 |
| Your Reference | UNITS | SV06 | SV11 | SV12 | SV13 | SV13-R |
| Date Sampled | | 04/11/2019 | 04/11/2019 | 04/11/2019 | 05/11/2019 | 05/11/2019 |
| Type of sample | | Canister | Canister | Canister | Canister | Canister |
| Air Kit Security No. | | 1697 | 2460 | 3644 | 3510 | 1699 |
| Date prepared | - | 07/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 |
| Date analysed | - | 07/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 |
| Helium (He) | % | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |

| Permanent Gas analysis | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 230172-11 | 230172-12 | 230172-13 | 230172-14 | 230172-15 |
| Your Reference | UNITS | SV14 | SV15 | SV16 | SV17 | SV18 |
| Date Sampled | | 05/11/2019 | 05/11/2019 | 05/11/2019 | 05/11/2019 | 05/11/2019 |
| Type of sample | | Canister | Canister | Canister | Canister | Canister |
| Air Kit Security No. | | 2289 | 2284 | 2273 | 2467 | 2283 |
| Date prepared | - | 08/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 |
| Date analysed | - | 08/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 | 07/11/2019 |
| Helium (He) | % | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |

| Permanent Gas analysis | | |
|---|---|---|
| Our Reference | | 230172-16 |
| Your Reference | UNITS | SV19 |
| Date Sampled | | 05/11/2019 |
| Type of sample | | Canister |
| Air Kit Security No. | | 3639 |
| Date prepared | - | 08/11/2019 |
| Date analysed | - | 08/11/2019 |
| Helium (He) | % | <0.01 |

| Method ID | Methodology Summary |
|---|---|
| AT-003 | Gases determined by GC-FID/TCD using methods ASTM 1945, 1946 and USEPA 3C. |
| TO15 | USEPA TO15 - Analysis of VOC's in air following USEPA TO15 protocols |

| QUALITY CONTROL: TO15 Chlorinated in Cans ppbv | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Vacuum before Shipment | Hg" | | | [NT] | 1 | -30 | -30 | 0 | [NT] | [NT] |
| Vacuum before Analysis | Hg" | | | [NT] | 1 | -6 | -6 | 0 | [NT] | [NT] |
| Date prepared | - | | | 08/11/2019 | 1 | 08/11/2019 | 08/11/2019 | | 08/11/2019 | [NT] |
| Date analysed | - | | | 08/11/2019 | 1 | 08/11/2019 | 08/11/2019 | | 08/11/2019 | [NT] |
| Vinyl chloride | ppbv | 0.3 | TO15 | <0.3 | 1 | <3 | <3 | 0 | [NT] | [NT] |
| Trichloroethene | ppbv | 0.3 | TO15 | <0.3 | 1 | 6000 | 6000 | 0 | [NT] | [NT] |
| 1,1-Dichloroethene | ppbv | 0.5 | TO15 | <0.5 | 1 | <5 | <5 | 0 | [NT] | [NT] |
| trans-1,2-dichloroethene | ppbv | 0.5 | TO15 | <0.5 | 1 | <5 | <5 | 0 | [NT] | [NT] |
| cis-1,2-Dichloroethene | ppbv | 0.5 | TO15 | <0.5 | 1 | 95 | 96 | 1 | [NT] | [NT] |
| Tetrachloroethene | ppbv | 0.5 | TO15 | <0.5 | 1 | 87 | 88 | 1 | [NT] | [NT] |
| *Surrogate*-Bromochloromethane | % rec | | TO15 | 98 | 1 | 101 | 100 | 1 | 112 | [NT] |
| *Surrogate* -1,4-Difluorobenzene | % rec | | TO15 | 92 | 1 | 99 | 99 | 0 | 103 | [NT] |
| *Surrogate*-Chlorobenzene-D5 | % rec | | TO15 | 86 | 1 | 95 | 96 | 1 | 100 | [NT] |

| QUALITY CONTROL: TO15 Chlorinated in Cans ppbv | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | [NT] | [NT] |
| Vacuum before Shipment | Hg" | | | [NT] | 11 | -30 | -30 | 0 | [NT] | [NT] |
| Vacuum before Analysis | Hg" | | | [NT] | 11 | -6 | -6 | 0 | [NT] | [NT] |
| Date prepared | - | | | [NT] | 11 | 08/11/2019 | 08/11/2019 | | [NT] | [NT] |
| Date analysed | - | | | [NT] | 11 | 08/11/2019 | 08/11/2019 | | [NT] | [NT] |
| Vinyl chloride | ppbv | 0.3 | TO15 | [NT] | 11 | <0.3 | <0.3 | 0 | [NT] | [NT] |
| Trichloroethene | ppbv | 0.3 | TO15 | [NT] | 11 | 730 | 730 | 0 | [NT] | [NT] |
| 1,1-Dichloroethene | ppbv | 0.5 | TO15 | [NT] | 11 | <0.5 | <0.5 | 0 | [NT] | [NT] |
| trans-1,2-dichloroethene | ppbv | 0.5 | TO15 | [NT] | 11 | <0.5 | <0.5 | 0 | [NT] | [NT] |
| cis-1,2-Dichloroethene | ppbv | 0.5 | TO15 | [NT] | 11 | <0.5 | <0.5 | 0 | [NT] | [NT] |
| Tetrachloroethene | ppbv | 0.5 | TO15 | [NT] | 11 | 21 | 21 | 0 | [NT] | [NT] |
| *Surrogate*-Bromochloromethane | % rec | | TO15 | [NT] | 11 | 96 | 97 | 1 | [NT] | [NT] |
| *Surrogate* -1,4-Difluorobenzene | % rec | | TO15 | [NT] | 11 | 89 | 89 | 0 | [NT] | [NT] |
| *Surrogate*-Chlorobenzene-D5 | % rec | | TO15 | [NT] | 11 | 88 | 87 | 1 | [NT] | [NT] |

| QUALITY CONTROL: TO15 chlorinated in Cans ug/m3 | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | [NT] | [NT] |
| Vacuum before Shipment | Hg" | | | [NT] | 1 | -30 | -30 | 0 | [NT] | [NT] |
| Vacuum before Analysis | Hg" | | | [NT] | 1 | -6 | -6 | 0 | [NT] | [NT] |
| Date prepared | - | | | 08/11/2019 | 1 | 08/11/2019 | 08/11/2019 | | [NT] | [NT] |
| Date analysed | - | | | 08/11/2019 | 1 | 08/11/2019 | 08/11/2019 | | [NT] | [NT] |
| Vinyl chloride | µg/m³ | 0.8 | TO15 | <0.8 | 1 | <7.7 | <7.7 | 0 | [NT] | [NT] |
| Trichloroethene | µg/m³ | 1.6 | TO15 | <1.6 | 1 | 32000 | 32000 | 0 | [NT] | [NT] |
| 1,1-Dichloroethene | µg/m³ | 2.0 | TO15 | <2.0 | 1 | <20 | <20 | 0 | [NT] | [NT] |
| trans-1,2-dichloroethene | µg/m³ | 2.0 | TO15 | <2.0 | 1 | <20 | <20 | 0 | [NT] | [NT] |
| cis-1,2-Dichloroethene | µg/m³ | 2.0 | TO15 | <2.0 | 1 | 380 | 380 | 0 | [NT] | [NT] |
| Tetrachloroethene | µg/m³ | 3.4 | TO15 | <3.4 | 1 | 590 | 590 | 0 | [NT] | [NT] |
| *Surrogate*-Bromochloromethane | % rec | | TO15 | 98 | 1 | 101 | 100 | 1 | [NT] | [NT] |
| *Surrogate* -1,4-Difluorobenzene | % rec | | TO15 | 92 | 1 | 99 | 99 | 0 | [NT] | [NT] |
| *Surrogate*-Chlorobenzene-D5 | % rec | | TO15 | 86 | 1 | 95 | 96 | 1 | [NT] | [NT] |

| QUALITY CONTROL: TO15 chlorinated in Cans ug/m3 | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | [NT] | [NT] |
| Vacuum before Shipment | Hg" | | | [NT] | 11 | -30 | -30 | 0 | [NT] | [NT] |
| Vacuum before Analysis | Hg" | | | [NT] | 11 | -6 | -6 | 0 | [NT] | [NT] |
| Date prepared | - | | | [NT] | 11 | 08/11/2019 | 08/11/2019 | | [NT] | [NT] |
| Date analysed | - | | | [NT] | 11 | 08/11/2019 | 08/11/2019 | | [NT] | [NT] |
| Vinyl chloride | µg/m³ | 0.8 | TO15 | [NT] | 11 | <0.8 | <0.8 | 0 | [NT] | [NT] |
| Trichloroethene | µg/m³ | 1.6 | TO15 | [NT] | 11 | 3900 | 3900 | 0 | [NT] | [NT] |
| 1,1-Dichloroethene | µg/m³ | 2.0 | TO15 | [NT] | 11 | <2 | <2 | 0 | [NT] | [NT] |
| trans-1,2-dichloroethene | µg/m³ | 2.0 | TO15 | [NT] | 11 | <2 | <2 | 0 | [NT] | [NT] |
| cis-1,2-Dichloroethene | µg/m³ | 2.0 | TO15 | [NT] | 11 | <2 | <2 | 0 | [NT] | [NT] |
| Tetrachloroethene | µg/m³ | 3.4 | TO15 | [NT] | 11 | 140 | 140 | 0 | [NT] | [NT] |
| *Surrogate*-Bromochloromethane | % rec | | TO15 | [NT] | 11 | 96 | 97 | 1 | [NT] | [NT] |
| *Surrogate* -1,4-Difluorobenzene | % rec | | TO15 | [NT] | 11 | 89 | 89 | 0 | [NT] | [NT] |
| *Surrogate*-Chlorobenzene-D5 | % rec | | TO15 | [NT] | 11 | 88 | 87 | 1 | [NT] | [NT] |

| QUALITY CONTROL: Permanent Gas analysis | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date prepared | - | | | 07/11/2019 | 1 | 07/11/2019 | 07/11/2019 | | 07/11/2019 | [NT] |
| Date analysed | - | | | 07/11/2019 | 1 | 07/11/2019 | 07/11/2019 | | 07/11/2019 | [NT] |
| Helium (He) | % | 0.01 | AT-003 | <0.01 | 1 | <0.01 | <0.01 | 0 | 103 | [NT] |

| QUALITY CONTROL: Permanent Gas analysis | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | [NT] | [NT] |
| Date prepared | - | | | [NT] | 11 | 08/11/2019 | 07/11/2019 | | [NT] | [NT] |
| Date analysed | - | | | [NT] | 11 | 08/11/2019 | 07/11/2019 | | [NT] | [NT] |
| Helium (He) | % | 0.01 | AT-003 | [NT] | 11 | <0.01 | <0.01 | 0 | [NT] | [NT] |

## Result Definitions

| | |
|---|---|
| **NT** | Not tested |
| **NA** | Test not required |
| **INS** | Insufficient sample for this test |
| **PQL** | Practical Quantitation Limit |
| **<** | Less than |
| **>** | Greater than |
| **RPD** | Relative Percent Difference |
| **LCS** | Laboratory Control Sample |
| **NS** | Not specified |
| **NEPM** | National Environmental Protection Measure |
| **NR** | Not Reported |

## Quality Control Definitions

| | |
|---|---|
| **Blank** | This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples. |
| **Duplicate** | This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable. |
| **Matrix Spike** | A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist. |
| **LCS (Laboratory Control Sample)** | This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample. |
| **Surrogate Spike** | Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples. |

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

## Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sam

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

## Report Comments

AIR_TO15_PCETCE/AIR_TO15_UG_TCE:

PQL has been raised due to the high level of analytes present in the sample/s.

LCS has been run as Ozone Precursor standard; the recovery of LCS cannot be reported due to the fact they are not in the list of analytes requested.
However, the non-reported analytes within the LCS had acceptable recoveries.

# CHAIN OF CUSTODY - CANISTERS / BAGS / TD TUBES

**ENVIROLAB GROUP** - National phone number 1300 424 344

page 1/1


Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
Ph: 03 9763 2500 / melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph: 08 7087 6800 / adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0828
Ph: 08 8967 1201 / darwin@envirolab.com.au


| | |
|---|---|
| **Client:** Golder | **Client Project Name / Number / Site etc. (I.e. report title):** 19131233 EPA - Albert Park |
| **Contact Person:** James Coley | |
| **Project Mgr:** " | **PO No.:** |
| **Sampler:** Josh Innes | **Envirolab Quote No. :** 195A140 |
| **Address:** 118 Franklin St | **Date results required:** Or choose: standard / same day / 1 day / 2 day / 3 day |
| | *Note: Inform lab in advance if urgent turnaround is required - surcharges apply* |
| **Phone:** 32132100 **Mob:** | **Additional report format:** esdat / equis / |
| **Email:** JColey@golder.com.au | **Lab Comments:** |

| Sample Information | | | | | | | | | | | | Tests Required | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Collection Time | | Canister Vacuum (Hg") | | | | | | | | | | |
| Envirolab Sample ID | Client Sample ID (Field Location) | Canister / TD Tube # | Soil Gas Train / Mass Flow Controller # | Leak Test Passed (Y/N) | PID Reading (ppmv) | Date of Collection | Time On | Time Off | Initial | Final | Flow Rate (Bags/TD Tubes only) | TO-15 (Cans/Bags) / TO-17 (Tubes) | TPH | 5 Sulphides (Cans/Bags only) | Ozone Precursors | General Gases* (Cans/Bags only) | RGA Full List (Cans/Bags only) | [illegible] | Helium |
| 1 | SV01-D | 2462 | | | | 4/11/19 | | | | | | X | | | | | | X | |
| 2 | SV01-S | 3249 | | | | | | | | | | X | | | | | | X | |
| 3 | SV02 | 2259 | | | | | | | | | | X | | | | | | X | |
| 4 | SV03_D | 1872 | | | | | | | | | | X | | | | | | X | |
| 5 | SV03-S | 3655 | | | | | | | | | | X | | | | | | X | |
| 6 | SV06 | 1697 | | | | | | | | | | X | | | | | | X | |
| 7 | SV11 | 2460 | | | | | | | | | | X | | | | | | X | |
| 8 | SV12 | 5644 | | | | | | | | | | X | | | | | | X | |
| 9 | SV13 | 3510 | | | | 5/11/19 | | | | | | X | | | | | | X | |
| 10 | SV13-R | 1699 | | | | | | | | | | X | | | | | | X | |
| 11 | SV14 | 2259 | | | | | | | | | | X | | | | | | X | |
| 12 | SV15 | 2254 | | | | | | | | | | X | | | | | | X | |
| 13 | SV16 | 2273 | | | | | | | | | | X | | | | | | X | |
| 14 | SV17 | 2467 | | | | | | | | | | X | | | | | | X | |
| 15 | SV18 | 2253 | | | | | | | | | | X | | | | | | X | |
| 16 | SV19 | 3639 | | | | | | | | | | X | | | | | | X | |
| | | | | | | | | | | | | X | | | | | | X | |

ENVIROLAB *Envirolab Services 12 Ashley St Chatswood NSW 2067 Ph: (02) 9910 6200*

Job No: 230172

Date Received: 6/11/19

Time Received: 11:00

Received By: DT

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

* General Gases - Please tick one:

1) Methane, Oxygen, Carbon dioxide, Carbon monoxide, Nitrogen
2) Methane, Oxygen, Carbon dioxide, Carbon monoxide, Helium, Hydrogen
3) Specify analytes (NB: If both Nitrogen and Helium/Hydrogen are require, please contact the laboratory

| | | |
|---|---|---|
| **Relinquished by (Company):** Golder | **Received by (Company):** ELS | ***Lab Use Only:*** |
| **Print Name:** Josh Innes | **Print Name:** Alex Stark | **Job number:** |
| **Date & Time:** 5-11-19 | **Date & Time:** 5/11/19 | **Security seal: Intact / Broken / None** |
| **Signature:** | **Signature:** | **TAT Req - SAME day / 1 / 2 / 3 / 4 / STD** |

**Daniel Ford** 230172

**Subject:** FW: Albert Park Summas and WMS

**From:** Coley, James <JColey@golder.com.au>
**Sent:** Wednesday, 6 November 2019 12:28 PM
**To:** Envirolab Adelaide <adelaide@envirolab.com.au>
**Cc:** Innes, Joshua <JInnes@golder.com.au>
**Subject:** Albert Park Summas and WMS

Hi Alex,

Regarding the summa canisters and WMS Josh dropped yesterday and today, these are for the EPA Albert Park job. EPA are clear they only want relevant contaminants reported, not the entire suite that normally comes with TO15. I know the method and cost will be the same.

Can you please make sure the lab reports for both Summas and WMS only include results for:

- 1,1-Dichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-dichloroethene
- Trichloroethene
- Tetrachloroethene
- Vinyl chloride
- Helium (summas only)

Any probs let me know.
Thanks

James Coley
*Senior Environmental Consultant*

Golder Associates Pty Ltd
118 Franklin Street, Adelaide, South Australia 5000, Australia
T: +61 8 8213 2100 | D: 08 8213 2106 | M: 0433 336 006 | golder.com

GOLDER
Work Safe, Home Safe

**Envirolab Services (WA) Pty Ltd trading as MPL Laboratories**
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph 08 9317 2505 fax 08 9317 4163
lab@mpl.com.au
www.mpl.com.au

# CERTIFICATE OF ANALYSIS 235836

## Client Details

| | |
|---|---|
| **Client** | Golder Associates |
| **Attention** | James Coley |
| **Address** | Level 1, 251a Morphett Street, ADELAIDE, SA, 5000 |

## Sample Details

| | |
|---|---|
| **Your Reference** | **19131233 Albert Park** |
| **Number of Samples** | 10 Waterloo |
| **Date samples received** | 07/11/2019 |
| **Date completed instructions received** | 07/11/2019 |
| **Sampler Name** | Not applicable for this job |

## Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

## Report Details

| | |
|---|---|
| **Date results requested by** | 14/11/2019 |
| **Date of Issue** | 12/11/2019 |

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

**Results Approved By**
Michael Kubiak, Laboratory Manager

**Authorised By**

Michael Kubiak, Laboratory Manager

| Low Level Vapour Suite-WMS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Our Reference | | | 235836-1 | 235836-2 | 235836-3 | 235836-4 | 235836-5 |
| Your Reference | UNITS | PQL | WMS01 | WMS02 | WMS03 | WMS04 | WMS05 |
| Start Date | | | 30/10/2019 | 30/10/2019 | 30/10/2019 | 30/10/2019 | 30/10/2019 |
| Finish Date | | | 06/11/2019 | 06/11/2019 | 06/11/2019 | 06/11/2019 | 06/11/2019 |
| Type of sample | | | WMS | WMS | WMS | WMS | WMS |
| Date extracted | - | | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 |
| Date analysed | - | | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 |
| *Surrogate* Toluene-$d_8$ | % | | 91 | 94 | 93 | 96 | 92 |

| Low Level Vapour Suite-WMS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Our Reference | | | 235836-6 | 235836-7 | 235836-8 | 235836-9 | 235836-10 |
| Your Reference | UNITS | PQL | WMS06 | WMS07 | WMS08 | WMS09 | WMS-DUPA |
| Start Date | | | 30/10/2019 | 30/10/2019 | 30/10/2019 | 30/10/2019 | 30/10/2019 |
| Finish Date | | | 06/11/2019 | 06/11/2019 | 06/11/2019 | 06/11/2019 | 06/11/2019 |
| Type of sample | | | WMS | WMS | WMS | WMS | WMS |
| Date extracted | - | | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 |
| Date analysed | - | | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 |
| *Surrogate* Toluene-$d_8$ | % | | 92 | 94 | 94 | 93 | 94 |

| VOC/TRH Vapour Suite-Waterloo | | | | | | | |
|---|---|---|---|---|---|---|---|
| Our Reference | | | 235836-1 | 235836-2 | 235836-3 | 235836-4 | 235836-5 |
| Your Reference | UNITS | PQL | WMS01 | WMS02 | WMS03 | WMS04 | WMS05 |
| Start Date | | | 30/10/2019 | 30/10/2019 | 30/10/2019 | 30/10/2019 | 30/10/2019 |
| Finish Date | | | 06/11/2019 | 06/11/2019 | 06/11/2019 | 06/11/2019 | 06/11/2019 |
| Type of sample | | | WMS | WMS | WMS | WMS | WMS |
| Date extracted | - | | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 |
| Date analysed | - | | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 |
| Sampling Time | minutes | | 10,000 | 10,100 | 9,960 | 9,960 | 9,940 |
| 1,1-Dichloroethene | µg/m3 | | <11 | <11 | <11 | <11 | <11 |
| Cis-1,2-dichloroethene | µg/m3 | | <8 | <8 | <8 | <8 | <8 |
| Trans-1,2-dichloroethene | µg/m3 | | <9 | <9 | <9 | <9 | <9 |
| Trichloroethene (TCE) | µg/m3 | | <6 | <6 | <6 | <6 | <6 |
| Tetrachloroethene (PCE) | µg/m3 | | <4 | <4 | <4 | <4 | <4 |
| Vinyl Chloride* | µg/m3 | | <122 | <121 | <122 | <122 | <123 |
| *Surrogate* Toluene-$d_8$ | % | | 91 | 94 | 93 | 96 | 92 |

| VOC/TRH Vapour Suite-Waterloo | | | | | | | |
|---|---|---|---|---|---|---|---|
| Our Reference | | | 235836-6 | 235836-7 | 235836-8 | 235836-9 | 235836-10 |
| Your Reference | UNITS | PQL | WMS06 | WMS07 | WMS08 | WMS09 | WMS-DUPA |
| Start Date | | | 30/10/2019 | 30/10/2019 | 30/10/2019 | 30/10/2019 | 30/10/2019 |
| Finish Date | | | 06/11/2019 | 06/11/2019 | 06/11/2019 | 06/11/2019 | 06/11/2019 |
| Type of sample | | | WMS | WMS | WMS | WMS | WMS |
| Date extracted | - | | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 |
| Date analysed | - | | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 |
| Sampling Time | minutes | | 9,940 | 9,900 | 9,870 | 9,880 | 9,940 |
| 1,1-Dichloroethene | µg/m3 | | <11 | <11 | <11 | <11 | <11 |
| Cis-1,2-dichloroethene | µg/m3 | | <8 | <8 | <8 | <8 | <8 |
| Trans-1,2-dichloroethene | µg/m3 | | <9 | <9 | <9 | <9 | <9 |
| Trichloroethene (TCE) | µg/m3 | | 6 | <6 | <6 | <6 | 6 |
| Tetrachloroethene (PCE) | µg/m3 | | <4 | <4 | <4 | <4 | <4 |
| Vinyl Chloride* | µg/m3 | | <123 | <123 | <124 | <123 | <123 |
| *Surrogate* Toluene-$d_8$ | % | | 92 | 94 | 94 | 93 | 94 |

| Method ID | Methodology Summary |
|---|---|
| **ORG-023** | Organic Vapours using GC-FID and GC-MS analysis after chemical desorption of Waterloo Membrane Samplers (WMS).<br><br>Where concentration results are provided, uptake rates have been sourced from SiREM (the WMS supplier).<br><br>Note, not all analytes have a currently available uptake rate and therefore conversion to concentration may not be feasible (an alternative compound with an uptake rate may be used but this will decrease the accuracy of the data - such instances are indicated by 'as C7' or 'as Nap' for example - see below).<br><br>Where TRH fractions are reported as a concentration, the uptake rate for Heptane (C7) is used for >C6-C10 and Naphthalene (Nap) for >C10-C16, note that these uptake rates may not accurately represent many of the broad range of compounds that elute within these fractions. Therefore the data is indicative only. |

| QUALITY CONTROL: Low Level Vapour Suite-WMS | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date extracted | - | | | 11/11/2019 | [NT] | [NT] | [NT] | [NT] | 11/11/2019 | [NT] |
| Date analysed | - | | | 11/11/2019 | [NT] | [NT] | [NT] | [NT] | 11/11/2019 | [NT] |
| 1,1-Dichloroethene | µg/sampler | 0.05 | ORG-023 | <0.05 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Cis-1,2-dichloroethene | µg/sampler | 0.05 | ORG-023 | <0.05 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Trans-1,2-dichloroethene | µg/sampler | 0.05 | ORG-023 | <0.05 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Trichloroethene (TCE) | µg/sampler | 0.05 | ORG-023 | <0.05 | [NT] | [NT] | [NT] | [NT] | 105 | [NT] |
| Tetrachloroethene (PCE) | µg/sampler | 0.05 | ORG-023 | <0.05 | [NT] | [NT] | [NT] | [NT] | 105 | [NT] |
| Vinyl Chloride* | µg/sampler | 0.5 | ORG-023 | <0.5 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate* Toluene-$d_8$ | % | | | 112 | [NT] | [NT] | [NT] | [NT] | 104 | [NT] |

| QUALITY CONTROL: VOC/TRH Vapour Suite-Waterloo | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date extracted | - | | | 11/11/2019 | [NT] | [NT] | [NT] | [NT] | 11/11/2019 | [NT] |
| Date analysed | - | | | 11/11/2019 | [NT] | [NT] | [NT] | [NT] | 11/11/2019 | [NT] |
| *Surrogate* Toluene-$d_8$ | % | | | 112 | [NT] | [NT] | [NT] | [NT] | 104 | [NT] |

## Result Definitions

| | |
|---|---|
| **DOL** | Samples rejected due to particulate overload |
| **RPF** | Sample rejected due to pump failure |
| **RFD** | Sample rejected due to filter damage |
| **RUD** | Sample rejected due to uneven deposition |
| **PQL** | Practical quantitation limit |

## Quality Control Definitions

| | |
|---|---|
| **Blank** | This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples. |
| **Duplicate** | This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable. |
| **Matrix Spike** | A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist. |
| **LCS (Laboratory Control Sample)** | This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample. |
| **Surrogate Spike** | Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples. |

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available).

## Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Samples received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

# Chain of Custody Record

Golder Associates Pty Ltd
118 Franklin Street,
Adelaide,

GOLDER

| | | | |
|---|---|---|---|
| **PROJECT:** | Albert Park | **DATE RESULTS REQUIRED:** | Standard |
| **PROJ No.:** | 19131233 | **E-MAIL RESULTS:** | ~~Jinnes@golder.com.au~~ |
| **SAMPLED BY:** | JI | **CC RESULTS:** | SAContaminatedLandGroup@golder.com |
| **CONTACT:** | James Coley | | Jcoley@golder.com.au |
| **LABORATORY:** | Envirolab | **QUOTE No:** | 19SA140 |

| Laboratory ID | Field ID | Date Sampled | Sample Type | Fill / Natural | Analyses Required X: 1,1-Dichloroethene, cis-1,2-Dichloroethene, trans-1,2-dichloroethene, Trichloroethene, Tetrachloroethene | Vinyl chloride | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | WMS01 | 6/11/2019 | WMS | - | X | X | | | | | | | |
| 2 | WMS02 | 43775 | WMS | - | X | X | | | | | | | |
| 3 | WMS03 | 43775 | WMS | - | X | X | | | | | | | |
| 4 | WMS04 | 43775 | WMS | - | X | X | | | | | | | |
| 5 | WMS05 | 43775 | WMS | - | X | X | | | | | | | |
| 6 | WMS06 | 43775 | WMS | - | X | X | | | | | | | |
| 7 | WMS07 | 43775 | WMS | - | X | X | | | | | | | |
| 8 | WMS08 | 43775 | WMS | - | X | X | | | | | | | |
| 9 | WMS09 | 43775 | WMS | - | X | X | | | | | | | |
| 10 | WMS-DUPA | 43775 | WMS | - | X | X | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | Totals : | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Laboratories
Job No.- 235836
Date Rec - 7/11
Time Rec - 11:55
Rec By -
TAT Req - SAME 1 / 2 / 3 / STD
Temp - Cool / ambient
Cooling - Ice / Ice pack / None
Security Seal - Yes / No

**Any samples heavily contaminated? No**

*NOTE:*

| | Name | Organisation | Samples Intact? | Samples Chilled? | Date | Time | Signature |
|---|---|---|---|---|---|---|---|
| RELEASED BY: | Josh Innes | Golder Associates | Yes | Yes | 6/11/19 | 1PM | |
| RECEIVED BY: | Jodie Bowden. | Envirolab | *Esky Intact* Yes / No | *Security Seals Intact* Yes / No | 6/11/19 | | |
| RELEASED BY: | | | Yes / No | Yes / No | | | |
| RECEIVED BY: | Maike Oscenda | APL | *Esky Intact* Yes / No | *Security Seals Intact* Yes / No | 7/11 | 11:55 | |

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **EM1920038** | Page | : 1 of 11 |
| Client | : **GOLDER ASSOCIATES** | Laboratory | : Environmental Division Melbourne |
| Contact | : GOLDER CONTACT | Contact | : Benjamin Comensoli |
| Address | : Level 3, 118 Franklin Street<br>ADELAIDE SA, AUSTRALIA 5000 | Address | : 4 Westall Rd Springvale VIC Australia 3171 |
| Telephone | : +61 08 8213 2100 | Telephone | : +61-3-8549 9600 |
| Project | : 19131233 Albert Park | Date Samples Received | : 25-Nov-2019 09:55 |
| Order number | : 19131233 | Date Analysis Commenced | : 25-Nov-2019 |
| C-O-C number | : ---- | Issue Date | : 02-Dec-2019 14:26 |
| Sampler | : JOSH INNES | | |
| Site | : Alber Park | | |
| Quote number | : EN/002/18 National BQ | | |
| No. of samples received | : 8 | | |
| No. of samples analysed | : 8 | | |

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

| *Signatories* | *Position* | *Accreditation Category* |
|---|---|---|
| Dilani Fernando | Senior Inorganic Chemist | Melbourne Inorganics, Springvale, VIC |
| Edwandy Fadjar | Organic Coordinator | Sydney Organics, Smithfield, NSW |
| Nancy Wang | 2IC Organic Chemist | Melbourne Organics, Springvale, VIC |
| Nikki Stepniewski | Senior Inorganic Instrument Chemist | Melbourne Inorganics, Springvale, VIC |

## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EA010-P: Electrical Conductivity @ 25°C was analysed by manual method (EA010).
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP125: Particular sample EM1920038_04 shows positive hits. Confirmed by re-analysis.
- EP080: Particular samples EM1920038_01, 03, 04, 05 shows positive hit of C6-C9/C6-C10 band due to Trichloroethylene.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- ED045G: The presence of thiocyanate can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

## Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | Client sample ID | GW01 | GW02 | GW03 | GW04 | GW05 |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 |
| Compound | CAS Number | LOR | Unit | EM1920038-001 | EM1920038-002 | EM1920038-003 | EM1920038-004 | EM1920038-005 |
| | | | | Result | Result | Result | Result | Result |
| **EA005P: pH by PC Titrator** | | | | | | | | |
| pH Value | ---- | 0.01 | pH Unit | 7.95 | 8.12 | 8.00 | 8.15 | 8.02 |
| **EA010P: Conductivity by PC Titrator** | | | | | | | | |
| Electrical Conductivity @ 25°C | ---- | 1 | µS/cm | 2600 | 5210 | 7890 | 2360 | 3450 |
| **EA016: Calculated TDS (from Electrical Conductivity)** | | | | | | | | |
| Total Dissolved Solids (Calc.) | ---- | 1 | mg/L | 1690 | 3390 | 5130 | 1530 | 2240 |
| **EA065: Total Hardness as CaCO3** | | | | | | | | |
| Total Hardness as CaCO3 | ---- | 1 | mg/L | 457 | 372 | 727 | 135 | 570 |
| **EA165: CO2 - Free and Total** | | | | | | | | |
| Free Carbon Dioxide as CO2 | 85540-96-1 | 1 | mg/L | 64 | 84 | 106 | 47 | 54 |
| Total Carbon Dioxide as CO2 | 85540-96-1 | 1 | mg/L | 768 | 1320 | 1200 | 851 | 779 |
| **ED037P: Alkalinity by PC Titrator** | | | | | | | | |
| Hydroxide Alkalinity as CaCO3 | DMO-210-001 | 1 | mg/L | <1 | <1 | <1 | <1 | <1 |
| Carbonate Alkalinity as CaCO3 | 3812-32-6 | 1 | mg/L | <1 | <1 | <1 | <1 | <1 |
| Bicarbonate Alkalinity as CaCO3 | 71-52-3 | 1 | mg/L | 800 | 1400 | 1240 | 914 | 823 |
| Total Alkalinity as CaCO3 | ---- | 1 | mg/L | 800 | 1400 | 1240 | 914 | 823 |
| **ED041G: Sulfate (Turbidimetric) as SO4 2- by DA** | | | | | | | | |
| Sulfate as SO4 - Turbidimetric | 14808-79-8 | 1 | mg/L | 139 | 279 | 582 | 132 | 260 |
| **ED045G: Chloride by Discrete Analyser** | | | | | | | | |
| Chloride | 16887-00-6 | 1 | mg/L | 396 | 851 | 1630 | 185 | 568 |
| **ED093F: Dissolved Major Cations** | | | | | | | | |
| Calcium | 7440-70-2 | 1 | mg/L | 51 | 37 | 70 | 16 | 65 |
| Magnesium | 7439-95-4 | 1 | mg/L | 80 | 68 | 134 | 23 | 99 |
| Sodium | 7440-23-5 | 1 | mg/L | 385 | 996 | 1600 | 469 | 527 |
| Potassium | 7440-09-7 | 1 | mg/L | 14 | 11 | 23 | 10 | 18 |
| **EG020F: Dissolved Metals by ICP-MS** | | | | | | | | |
| Arsenic | 7440-38-2 | 0.001 | mg/L | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 |
| Boron | 7440-42-8 | 0.05 | mg/L | 1.18 | 1.47 | 2.05 | 2.59 | 1.81 |
| Barium | 7440-39-3 | 0.001 | mg/L | 0.079 | 0.065 | 0.041 | 0.045 | 0.263 |
| Beryllium | 7440-41-7 | 0.001 | mg/L | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Cadmium | 7440-43-9 | 0.0001 | mg/L | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.0007 |
| Cobalt | 7440-48-4 | 0.001 | mg/L | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Chromium | 7440-47-3 | 0.001 | mg/L | 0.001 | <0.001 | <0.001 | 0.001 | 0.012 |
| Copper | 7440-50-8 | 0.001 | mg/L | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 |
| Manganese | 7439-96-5 | 0.001 | mg/L | 0.003 | 0.002 | 0.026 | 0.001 | 0.002 |

## Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | | Client sample ID | GW01 | GW02 | GW03 | GW04 | GW05 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 |
| Compound | CAS Number | LOR | Unit | | EM1920038-001 | EM1920038-002 | EM1920038-003 | EM1920038-004 | EM1920038-005 |
| | | | | | Result | Result | Result | Result | Result |
| **EG020F: Dissolved Metals by ICP-MS - Continued** | | | | | | | | | |
| Nickel | 7440-02-0 | 0.001 | mg/L | | <0.001 | <0.001 | <0.001 | <0.001 | **0.001** |
| Lead | 7439-92-1 | 0.001 | mg/L | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Selenium | 7782-49-2 | 0.01 | mg/L | | <0.01 | <0.01 | <0.01 | **0.02** | **0.01** |
| Vanadium | 7440-62-2 | 0.01 | mg/L | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Zinc | 7440-66-6 | 0.005 | mg/L | | <0.005 | <0.005 | **0.006** | **0.007** | **0.006** |
| **EG035F: Dissolved Mercury by FIMS** | | | | | | | | | |
| Mercury | 7439-97-6 | 0.0001 | mg/L | | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| **EG051G: Ferrous Iron by Discrete Analyser** | | | | | | | | | |
| Ferrous Iron | ---- | 0.05 | mg/L | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| **EK040P: Fluoride by PC Titrator** | | | | | | | | | |
| Fluoride | 16984-48-8 | 0.1 | mg/L | | **2.1** | **2.7** | **2.2** | **2.6** | **2.1** |
| **EK058G: Nitrate as N by Discrete Analyser** | | | | | | | | | |
| Nitrate as N | 14797-55-8 | 0.01 | mg/L | | **3.41** | **0.04** | **1.15** | **15.2** | **25.7** |
| **EN055: Ionic Balance** | | | | | | | | | |
| ø Total Anions | ---- | 0.01 | meq/L | | **30.0** | **57.8** | **82.9** | **26.2** | **37.9** |
| ø Total Cations | ---- | 0.01 | meq/L | | **26.2** | **51.0** | **84.7** | **23.3** | **34.8** |
| ø Ionic Balance | ---- | 0.01 | % | | **6.78** | **6.19** | **1.09** | **5.81** | **4.27** |
| **EP033: C1 - C4 Hydrocarbon Gases** | | | | | | | | | |
| Methane | 74-82-8 | 10 | µg/L | | <10 | <10 | <10 | <10 | <10 |
| **EP075(SIM)B: Polynuclear Aromatic Hydrocarbons** | | | | | | | | | |
| Naphthalene | 91-20-3 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Acenaphthylene | 208-96-8 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Acenaphthene | 83-32-9 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Fluorene | 86-73-7 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Phenanthrene | 85-01-8 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Anthracene | 120-12-7 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Fluoranthene | 206-44-0 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Pyrene | 129-00-0 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benz(a)anthracene | 56-55-3 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Chrysene | 218-01-9 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(b+j)fluoranthene | 205-99-2 205-82-3 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(k)fluoranthene | 207-08-9 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(a)pyrene | 50-32-8 | 0.5 | µg/L | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

## Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | | Client sample ID | GW01 | GW02 | GW03 | GW04 | GW05 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 |
| Compound | CAS Number | LOR | Unit | | EM1920038-001 | EM1920038-002 | EM1920038-003 | EM1920038-004 | EM1920038-005 |
| | | | | | Result | Result | Result | Result | Result |
| **EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued** | | | | | | | | | |
| Dibenz(a.h)anthracene | 53-70-3 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Benzo(g.h.i)perylene | 191-24-2 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| ^ Sum of polycyclic aromatic hydrocarbons | ---- | 0.5 | µg/L | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ^ Benzo(a)pyrene TEQ (zero) | ---- | 0.5 | µg/L | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | | |
| C6 - C9 Fraction | ---- | 20 | µg/L | | **170** | <20 | **840** | **50** | **140** |
| C10 - C14 Fraction | ---- | 50 | µg/L | | <50 | <50 | <50 | <50 | <50 |
| C15 - C28 Fraction | ---- | 100 | µg/L | | <100 | <100 | <100 | <100 | <100 |
| C29 - C36 Fraction | ---- | 50 | µg/L | | <50 | <50 | <50 | <50 | <50 |
| ^ C10 - C36 Fraction (sum) | ---- | 50 | µg/L | | <50 | <50 | <50 | <50 | <50 |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions** | | | | | | | | | |
| C6 - C10 Fraction | C6_C10 | 20 | µg/L | | **160** | <20 | **800** | **40** | **140** |
| ^ C6 - C10 Fraction minus BTEX (F1) | C6_C10-BTEX | 20 | µg/L | | **160** | <20 | **800** | **40** | **140** |
| >C10 - C16 Fraction | ---- | 100 | µg/L | | <100 | <100 | <100 | <100 | <100 |
| >C16 - C34 Fraction | ---- | 100 | µg/L | | <100 | <100 | <100 | <100 | <100 |
| >C34 - C40 Fraction | ---- | 100 | µg/L | | <100 | <100 | <100 | <100 | <100 |
| ^ >C10 - C40 Fraction (sum) | ---- | 100 | µg/L | | <100 | <100 | <100 | <100 | <100 |
| ^ >C10 - C16 Fraction minus Naphthalene (F2) | ---- | 100 | µg/L | | <100 | <100 | <100 | <100 | <100 |
| **EP080: BTEXN** | | | | | | | | | |
| Benzene | 71-43-2 | 1 | µg/L | | <1 | <1 | <1 | <1 | <1 |
| Toluene | 108-88-3 | 2 | µg/L | | <2 | <2 | <2 | <2 | <2 |
| Ethylbenzene | 100-41-4 | 2 | µg/L | | <2 | <2 | <2 | <2 | <2 |
| meta- & para-Xylene | 108-38-3 106-42-3 | 2 | µg/L | | <2 | <2 | <2 | <2 | <2 |
| ortho-Xylene | 95-47-6 | 2 | µg/L | | <2 | <2 | <2 | <2 | <2 |
| ^ Total Xylenes | ---- | 2 | µg/L | | <2 | <2 | <2 | <2 | <2 |
| ^ Sum of BTEX | ---- | 1 | µg/L | | <1 | <1 | <1 | <1 | <1 |
| Naphthalene | 91-20-3 | 5 | µg/L | | <5 | <5 | <5 | <5 | <5 |
| **EP125E: Halogenated Aliphatic Compounds** | | | | | | | | | |
| Dichlorodifluoromethane | 75-71-8 | 0.5 | µg/L | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Vinyl chloride | 75-01-4 | 0.3 | µg/L | | <0.3 | <0.3 | **2.3** | <0.3 | <0.3 |
| Bromomethane | 74-83-9 | 0.5 | µg/L | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chloroethane | 75-00-3 | 0.5 | µg/L | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |

## Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | | Client sample ID | GW01 | GW02 | GW03 | GW04 | GW05 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 |
| Compound | CAS Number | LOR | Unit | | EM1920038-001 | EM1920038-002 | EM1920038-003 | EM1920038-004 | EM1920038-005 |
| | | | | | Result | Result | Result | Result | Result |
| **EP125E: Halogenated Aliphatic Compounds - Continued** | | | | | | | | | |
| Trichlorofluoromethane | 75-69-4 | 0.5 | µg/L | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 1.1-Dichloroethene | 75-35-4 | 0.1 | µg/L | | **0.2** | <0.1 | **3.9** | <0.1 | **0.1** |
| Dichloromethane | 75-09-2 | 1.0 | µg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| trans-1.2-Dichloroethene | 156-60-5 | 0.1 | µg/L | | **1.8** | **0.2** | **2.6** | <0.1 | **0.3** |
| 1.1-Dichloroethane | 75-34-3 | 0.1 | µg/L | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| cis-1.2-Dichloroethene | 156-59-2 | 0.1 | µg/L | | **34.8** | **1.3** | **80.3** | <0.1 | **5.6** |
| Bromochloromethane | 74-97-5 | 0.5 | µg/L | | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 1.2-Dichloroethane | 107-06-2 | 0.1 | µg/L | | **0.4** | <0.1 | **0.8** | <0.1 | <0.1 |
| 1.1.1-Trichloroethane | 71-55-6 | 0.1 | µg/L | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Carbon Tetrachloride | 56-23-5 | 0.05 | µg/L | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Trichloroethene | 79-01-6 | 0.05 | µg/L | | **186** | **17.7** | **1130** | **0.08** | **177** |
| Tetrachloroethene | 127-18-4 | 0.05 | µg/L | | **0.36** | **0.05** | **10.4** | <0.05 | **0.35** |
| Hexachlorobutadiene | 87-68-3 | 0.04 | µg/L | | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| **EP075(SIM)S: Phenolic Compound Surrogates** | | | | | | | | | |
| Phenol-d6 | 13127-88-3 | 1.0 | % | | **25.5** | **31.0** | **30.1** | **26.8** | **26.7** |
| 2-Chlorophenol-D4 | 93951-73-6 | 1.0 | % | | **55.1** | **65.3** | **59.9** | **56.9** | **55.5** |
| 2.4.6-Tribromophenol | 118-79-6 | 1.0 | % | | **62.4** | **72.4** | **65.4** | **58.8** | **64.1** |
| **EP075(SIM)T: PAH Surrogates** | | | | | | | | | |
| 2-Fluorobiphenyl | 321-60-8 | 1.0 | % | | **78.3** | **90.0** | **85.2** | **84.6** | **76.5** |
| Anthracene-d10 | 1719-06-8 | 1.0 | % | | **82.7** | **99.6** | **92.3** | **81.3** | **87.4** |
| 4-Terphenyl-d14 | 1718-51-0 | 1.0 | % | | **81.9** | **97.9** | **90.7** | **79.5** | **86.8** |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | | |
| 1.2-Dichloroethane-D4 | 17060-07-0 | 2 | % | | **98.3** | **102** | **92.2** | **113** | **99.3** |
| Toluene-D8 | 2037-26-5 | 2 | % | | **94.0** | **94.7** | **81.8** | **109** | **93.2** |
| 4-Bromofluorobenzene | 460-00-4 | 2 | % | | **97.0** | **101** | **94.2** | **125** | **103** |
| **EP125S: VOC Surrogates** | | | | | | | | | |
| 1.2-Dichloroethane-D4 | 17060-07-0 | 0.1 | % | | **110** | **107** | **106** | **102** | **104** |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | **94.9** | **92.7** | **96.1** | **95.8** | **94.6** |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | **94.7** | **93.2** | **93.3** | **91.3** | **92.8** |

## Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | Client sample ID | R01 | TB01 | DUP1A | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | ---- | ---- |
| Compound | CAS Number | LOR | Unit | EM1920038-006 | EM1920038-007 | EM1920038-008 | -------- | -------- |
| | | | | Result | Result | Result | ---- | ---- |
| **EA005P: pH by PC Titrator** | | | | | | | | |
| pH Value | ---- | 0.01 | pH Unit | ---- | ---- | 8.12 | ---- | ---- |
| **EA010P: Conductivity by PC Titrator** | | | | | | | | |
| Electrical Conductivity @ 25°C | ---- | 1 | µS/cm | ---- | ---- | 5020 | ---- | ---- |
| **EA016: Calculated TDS (from Electrical Conductivity)** | | | | | | | | |
| Total Dissolved Solids (Calc.) | ---- | 1 | mg/L | ---- | ---- | 3260 | ---- | ---- |
| **EA065: Total Hardness as CaCO3** | | | | | | | | |
| Total Hardness as CaCO3 | ---- | 1 | mg/L | ---- | ---- | 374 | ---- | ---- |
| **EA165: CO2 - Free and Total** | | | | | | | | |
| Free Carbon Dioxide as CO2 | 85540-96-1 | 1 | mg/L | ---- | ---- | 76 | ---- | ---- |
| Total Carbon Dioxide as CO2 | 85540-96-1 | 1 | mg/L | ---- | ---- | 1330 | ---- | ---- |
| **ED037P: Alkalinity by PC Titrator** | | | | | | | | |
| Hydroxide Alkalinity as CaCO3 | DMO-210-001 | 1 | mg/L | ---- | ---- | <1 | ---- | ---- |
| Carbonate Alkalinity as CaCO3 | 3812-32-6 | 1 | mg/L | ---- | ---- | <1 | ---- | ---- |
| Bicarbonate Alkalinity as CaCO3 | 71-52-3 | 1 | mg/L | ---- | ---- | 1420 | ---- | ---- |
| Total Alkalinity as CaCO3 | ---- | 1 | mg/L | ---- | ---- | 1420 | ---- | ---- |
| **ED041G: Sulfate (Turbidimetric) as SO4 2- by DA** | | | | | | | | |
| Sulfate as SO4 - Turbidimetric | 14808-79-8 | 1 | mg/L | ---- | ---- | 267 | ---- | ---- |
| **ED045G: Chloride by Discrete Analyser** | | | | | | | | |
| Chloride | 16887-00-6 | 1 | mg/L | ---- | ---- | 854 | ---- | ---- |
| **ED093F: Dissolved Major Cations** | | | | | | | | |
| Calcium | 7440-70-2 | 1 | mg/L | ---- | ---- | 36 | ---- | ---- |
| Magnesium | 7439-95-4 | 1 | mg/L | ---- | ---- | 69 | ---- | ---- |
| Sodium | 7440-23-5 | 1 | mg/L | ---- | ---- | 1000 | ---- | ---- |
| Potassium | 7440-09-7 | 1 | mg/L | ---- | ---- | 12 | ---- | ---- |
| **EG020F: Dissolved Metals by ICP-MS** | | | | | | | | |
| Arsenic | 7440-38-2 | 0.001 | mg/L | <0.001 | ---- | <0.001 | ---- | ---- |
| Boron | 7440-42-8 | 0.05 | mg/L | <0.05 | ---- | 1.60 | ---- | ---- |
| Barium | 7440-39-3 | 0.001 | mg/L | <0.001 | ---- | 0.065 | ---- | ---- |
| Beryllium | 7440-41-7 | 0.001 | mg/L | <0.001 | ---- | <0.001 | ---- | ---- |
| Cadmium | 7440-43-9 | 0.0001 | mg/L | <0.0001 | ---- | <0.0001 | ---- | ---- |
| Cobalt | 7440-48-4 | 0.001 | mg/L | <0.001 | ---- | <0.001 | ---- | ---- |
| Chromium | 7440-47-3 | 0.001 | mg/L | <0.001 | ---- | <0.001 | ---- | ---- |
| Copper | 7440-50-8 | 0.001 | mg/L | <0.001 | ---- | <0.001 | ---- | ---- |
| Manganese | 7439-96-5 | 0.001 | mg/L | <0.001 | ---- | 0.002 | ---- | ---- |

## Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | | Client sample ID | R01 | TB01 | DUP1A | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | EM1920038-006 | EM1920038-007 | EM1920038-008 | -------- | -------- |
| | | | | | Result | Result | Result | ---- | ---- |
| **EG020F: Dissolved Metals by ICP-MS - Continued** | | | | | | | | | |
| Nickel | 7440-02-0 | 0.001 | mg/L | | <0.001 | ---- | <0.001 | ---- | ---- |
| Lead | 7439-92-1 | 0.001 | mg/L | | <0.001 | ---- | <0.001 | ---- | ---- |
| Selenium | 7782-49-2 | 0.01 | mg/L | | <0.01 | ---- | <0.01 | ---- | ---- |
| Vanadium | 7440-62-2 | 0.01 | mg/L | | <0.01 | ---- | <0.01 | ---- | ---- |
| Zinc | 7440-66-6 | 0.005 | mg/L | | <0.005 | ---- | <0.005 | ---- | ---- |
| **EG035F: Dissolved Mercury by FIMS** | | | | | | | | | |
| Mercury | 7439-97-6 | 0.0001 | mg/L | | <0.0001 | ---- | <0.0001 | ---- | ---- |
| **EG051G: Ferrous Iron by Discrete Analyser** | | | | | | | | | |
| Ferrous Iron | ---- | 0.05 | mg/L | | ---- | ---- | <0.05 | ---- | ---- |
| **EK040P: Fluoride by PC Titrator** | | | | | | | | | |
| Fluoride | 16984-48-8 | 0.1 | mg/L | | ---- | ---- | **3.0** | ---- | ---- |
| **EK058G: Nitrate as N by Discrete Analyser** | | | | | | | | | |
| Nitrate as N | 14797-55-8 | 0.01 | mg/L | | ---- | ---- | **0.04** | ---- | ---- |
| **EN055: Ionic Balance** | | | | | | | | | |
| ø Total Anions | ---- | 0.01 | meq/L | | ---- | ---- | **58.0** | ---- | ---- |
| ø Total Cations | ---- | 0.01 | meq/L | | ---- | ---- | **51.3** | ---- | ---- |
| ø Ionic Balance | ---- | 0.01 | % | | ---- | ---- | **6.17** | ---- | ---- |
| **EP033: C1 - C4 Hydrocarbon Gases** | | | | | | | | | |
| Methane | 74-82-8 | 10 | µg/L | | ---- | ---- | <10 | ---- | ---- |
| **EP075(SIM)B: Polynuclear Aromatic Hydrocarbons** | | | | | | | | | |
| Naphthalene | 91-20-3 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Acenaphthylene | 208-96-8 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Acenaphthene | 83-32-9 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Fluorene | 86-73-7 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Phenanthrene | 85-01-8 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Anthracene | 120-12-7 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Fluoranthene | 206-44-0 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Pyrene | 129-00-0 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Chrysene | 218-01-9 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Benzo(b+j)fluoranthene | 205-99-2 205-82-3 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Benzo(k)fluoranthene | 207-08-9 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.5 | µg/L | | <0.5 | ---- | <0.5 | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |

## Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | | Client sample ID | R01 | TB01 | DUP1A | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | EM1920038-006 | EM1920038-007 | EM1920038-008 | -------- | -------- |
| | | | | | Result | Result | Result | ---- | ---- |
| **EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued** | | | | | | | | | |
| Dibenz(a.h)anthracene | 53-70-3 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 1.0 | µg/L | | <1.0 | ---- | <1.0 | ---- | ---- |
| ^ Sum of polycyclic aromatic hydrocarbons | ---- | 0.5 | µg/L | | <0.5 | ---- | <0.5 | ---- | ---- |
| ^ Benzo(a)pyrene TEQ (zero) | ---- | 0.5 | µg/L | | <0.5 | ---- | <0.5 | ---- | ---- |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | | |
| C6 - C9 Fraction | ---- | 20 | µg/L | | <20 | <20 | <20 | ---- | ---- |
| C10 - C14 Fraction | ---- | 50 | µg/L | | <50 | ---- | <50 | ---- | ---- |
| C15 - C28 Fraction | ---- | 100 | µg/L | | <100 | ---- | <100 | ---- | ---- |
| C29 - C36 Fraction | ---- | 50 | µg/L | | <50 | ---- | <50 | ---- | ---- |
| ^ C10 - C36 Fraction (sum) | ---- | 50 | µg/L | | <50 | ---- | <50 | ---- | ---- |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions** | | | | | | | | | |
| C6 - C10 Fraction | C6_C10 | 20 | µg/L | | <20 | <20 | <20 | ---- | ---- |
| ^ C6 - C10 Fraction minus BTEX (F1) | C6_C10-BTEX | 20 | µg/L | | <20 | <20 | <20 | ---- | ---- |
| >C10 - C16 Fraction | ---- | 100 | µg/L | | <100 | ---- | <100 | ---- | ---- |
| >C16 - C34 Fraction | ---- | 100 | µg/L | | <100 | ---- | <100 | ---- | ---- |
| >C34 - C40 Fraction | ---- | 100 | µg/L | | <100 | ---- | <100 | ---- | ---- |
| ^ >C10 - C40 Fraction (sum) | ---- | 100 | µg/L | | <100 | ---- | <100 | ---- | ---- |
| ^ >C10 - C16 Fraction minus Naphthalene (F2) | ---- | 100 | µg/L | | <100 | ---- | <100 | ---- | ---- |
| **EP080: BTEXN** | | | | | | | | | |
| Benzene | 71-43-2 | 1 | µg/L | | <1 | <1 | <1 | ---- | ---- |
| Toluene | 108-88-3 | 2 | µg/L | | <2 | <2 | <2 | ---- | ---- |
| Ethylbenzene | 100-41-4 | 2 | µg/L | | <2 | <2 | <2 | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 2 | µg/L | | <2 | <2 | <2 | ---- | ---- |
| ortho-Xylene | 95-47-6 | 2 | µg/L | | <2 | <2 | <2 | ---- | ---- |
| ^ Total Xylenes | ---- | 2 | µg/L | | <2 | <2 | <2 | ---- | ---- |
| ^ Sum of BTEX | ---- | 1 | µg/L | | <1 | <1 | <1 | ---- | ---- |
| Naphthalene | 91-20-3 | 5 | µg/L | | <5 | <5 | <5 | ---- | ---- |
| **EP125E: Halogenated Aliphatic Compounds** | | | | | | | | | |
| Dichlorodifluoromethane | 75-71-8 | 0.5 | µg/L | | ---- | ---- | <0.5 | ---- | ---- |
| Vinyl chloride | 75-01-4 | 0.3 | µg/L | | ---- | ---- | <0.3 | ---- | ---- |
| Bromomethane | 74-83-9 | 0.5 | µg/L | | ---- | ---- | <0.5 | ---- | ---- |
| Chloroethane | 75-00-3 | 0.5 | µg/L | | ---- | ---- | <0.5 | ---- | ---- |

## Analytical Results

| Sub-Matrix: WATER (Matrix: WATER) | | | | Client sample ID | R01 | TB01 | DUP1A | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | 21-Nov-2019 00:00 | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | EM1920038-006 | EM1920038-007 | EM1920038-008 | -------- | -------- |
| | | | | | Result | Result | Result | ---- | ---- |
| **EP125E: Halogenated Aliphatic Compounds - Continued** | | | | | | | | | |
| Trichlorofluoromethane | 75-69-4 | 0.5 | µg/L | | ---- | ---- | <0.5 | ---- | ---- |
| 1.1-Dichloroethene | 75-35-4 | 0.1 | µg/L | | ---- | ---- | <0.1 | ---- | ---- |
| Dichloromethane | 75-09-2 | 1.0 | µg/L | | ---- | ---- | <1.0 | ---- | ---- |
| trans-1.2-Dichloroethene | 156-60-5 | 0.1 | µg/L | | ---- | ---- | **0.2** | ---- | ---- |
| 1.1-Dichloroethane | 75-34-3 | 0.1 | µg/L | | ---- | ---- | <0.1 | ---- | ---- |
| cis-1.2-Dichloroethene | 156-59-2 | 0.1 | µg/L | | ---- | ---- | **1.5** | ---- | ---- |
| Bromochloromethane | 74-97-5 | 0.5 | µg/L | | ---- | ---- | <0.5 | ---- | ---- |
| 1.2-Dichloroethane | 107-06-2 | 0.1 | µg/L | | ---- | ---- | <0.1 | ---- | ---- |
| 1.1.1-Trichloroethane | 71-55-6 | 0.1 | µg/L | | ---- | ---- | <0.1 | ---- | ---- |
| Carbon Tetrachloride | 56-23-5 | 0.05 | µg/L | | ---- | ---- | <0.05 | ---- | ---- |
| Trichloroethene | 79-01-6 | 0.05 | µg/L | | ---- | ---- | **17.5** | ---- | ---- |
| Tetrachloroethene | 127-18-4 | 0.05 | µg/L | | ---- | ---- | **0.05** | ---- | ---- |
| Hexachlorobutadiene | 87-68-3 | 0.04 | µg/L | | ---- | ---- | <0.04 | ---- | ---- |
| **EP075(SIM)S: Phenolic Compound Surrogates** | | | | | | | | | |
| Phenol-d6 | 13127-88-3 | 1.0 | % | | **23.6** | ---- | **24.6** | ---- | ---- |
| 2-Chlorophenol-D4 | 93951-73-6 | 1.0 | % | | **51.6** | ---- | **53.6** | ---- | ---- |
| 2.4.6-Tribromophenol | 118-79-6 | 1.0 | % | | **61.0** | ---- | **53.8** | ---- | ---- |
| **EP075(SIM)T: PAH Surrogates** | | | | | | | | | |
| 2-Fluorobiphenyl | 321-60-8 | 1.0 | % | | **72.6** | ---- | **74.2** | ---- | ---- |
| Anthracene-d10 | 1719-06-8 | 1.0 | % | | **88.0** | ---- | **74.5** | ---- | ---- |
| 4-Terphenyl-d14 | 1718-51-0 | 1.0 | % | | **87.5** | ---- | **71.2** | ---- | ---- |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | | |
| 1.2-Dichloroethane-D4 | 17060-07-0 | 2 | % | | **102** | **97.0** | **103** | ---- | ---- |
| Toluene-D8 | 2037-26-5 | 2 | % | | **101** | **98.4** | **99.8** | ---- | ---- |
| 4-Bromofluorobenzene | 460-00-4 | 2 | % | | **105** | **97.0** | **101** | ---- | ---- |
| **EP125S: VOC Surrogates** | | | | | | | | | |
| 1.2-Dichloroethane-D4 | 17060-07-0 | 0.1 | % | | ---- | ---- | **107** | ---- | ---- |
| Toluene-D8 | 2037-26-5 | 0.1 | % | | ---- | ---- | **92.8** | ---- | ---- |
| 4-Bromofluorobenzene | 460-00-4 | 0.1 | % | | ---- | ---- | **92.6** | ---- | ---- |

## Surrogate Control Limits

Sub-Matrix: **WATER**

| Compound | CAS Number | Recovery Limits (%) Low | High |
|---|---|---|---|
| **EP075(SIM)S: Phenolic Compound Surrogates** | | | |
| **Phenol-d6** | 13127-88-3 | 10 | 46 |
| **2-Chlorophenol-D4** | 93951-73-6 | 23 | 104 |
| **2.4.6-Tribromophenol** | 118-79-6 | 28 | 130 |
| **EP075(SIM)T: PAH Surrogates** | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 36 | 114 |
| **Anthracene-d10** | 1719-06-8 | 51 | 119 |
| **4-Terphenyl-d14** | 1718-51-0 | 49 | 127 |
| **EP080S: TPH(V)/BTEX Surrogates** | | | |
| **1.2-Dichloroethane-D4** | 17060-07-0 | 73 | 129 |
| **Toluene-D8** | 2037-26-5 | 70 | 125 |
| **4-Bromofluorobenzene** | 460-00-4 | 71 | 129 |
| **EP125S: VOC Surrogates** | | | |
| **1.2-Dichloroethane-D4** | 17060-07-0 | 73 | 130 |
| **Toluene-D8** | 2037-26-5 | 68 | 128 |
| **4-Bromofluorobenzene** | 460-00-4 | 71 | 120 |

# Chain of Custody Record

Golder Associates Pty Ltd
118 Franklin Street,

GOLDER

| | | | |
|---|---|---|---|
| **PROJECT:** | Albert Park | **DATE REQUIRED:** | Standard |
| **PROJ No.:** | 19131233 | **E-MAIL RESULTS:** | jcoley@golder.com.au |
| **SAMPLED BY:** | Josh Innes | **CC RESULTS:** | SAContaminatedLandGroup@golder.com |
| **CONTACT:** | James Coley | | |
| **LABORATORY:** | ALS | **QUOTE No:** | |

**Analyses Required X**

| Laboratory ID | Field ID | Date Sampled | Number of Containers | Ultra-trace Halogenated Aliphatics (EP125E) * | W-7 TRH, BTEX, PAH | W-3 Heavy metals | NT-12 Major cations and anions, TDS | W-28 Natural attenuation + manganese | carbon dioxide | volatile TRH C6-C10, BTEX | FREIGHT | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GW01 | 21/11/2019 | 12 | X | X | X | X | X | X | | | | | |
| | GW02 | 21/11/2019 | 12 | X | X | X | X | X | X | | | | | |
| | GW03 | 21/11/2019 | 12 | X | X | X | X | X | X | | | | | |
| | GW04 | 21/11/2019 | 12 | X | X | X | X | X | X | | | | | |
| | GW05 | 21/11/2019 | 12 | X | X | X | X | X | X | | | | | |
| | R01 | 21/11/2019 | 8 | | X | X | | | | | | | | |
| | TB01 | 21/11/2019 | 1 | | | | | | | X | | | | |
| | DUP1A | 21/11/2019 | 12 | X | X | X | X | X | X | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | **Totals** | 81 | 6 | 7 | 7 | 6 | 6 | 6 | 1 | 0 | 0 | 0 | 0 |

Environmental Division
Melbourne
Work Order Reference
EM1920038

Telephone : +61-3-8549 9600

**Any samples heavily contaminated? No**

| | Name | Organisation | Samples Intact? | Samples Chilled? | Date | Time | Signature |
|---|---|---|---|---|---|---|---|
| RELEASED BY: | Josh Innes / James Coley | Golder Associates | *Yes* | *Yes* | 21/11/19 | *4:00PM* | |
| RECEIVED BY: | | | ***Esky Intact*** / *Yes / No* | ***Security Seals Intact*** / *Yes / No* | | | |
| RELEASED BY: | | | *Yes / No* | *Yes / No* | | | |
| RECEIVED BY: | | | ***Esky Intact*** / *Yes / No* | ***Security Seals Intact*** / *Yes / No* | 25/11 | 0025 | |

***NOTE:***

*** including PCE, TCE, dichloroethene isomers and vinylchloride.**

## Ru Jayasinghe

**From:** Kieren Burns
**Sent:** Thursday, 21 November 2019 4:41 PM
**To:** COC Melbourne
**Subject:** FW: [EXTERNAL] - COC with analysis - 19131233 Albert Park
**Attachments:** COC-01 (21-11-2019) ALS.pdf

Hi Guys

These samples should be arriving in Melbourne tomorrow directly form Golder.

Regards

**Kieren Burns**
Business Development Manager - SA
Environmental

T +61 8 8162 5130
M +61 448 527 608
kieren.burns@alsglobal.com
Unit 3/1 Burma Road
Pooraka SA 5095


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**From:** Coley, James <JColey@golder.com.au>
**Sent:** Thursday, 21 November 2019 4:08 PM
**To:** Kieren Burns <Kieren.Burns@alsglobal.com>
**Cc:** Innes, Joshua <JInnes@golder.com.au>
**Subject:** [EXTERNAL] - COC with analysis - 19131233 Albert Park



Hi Kieren,

Please see the attached COC with analysis for water samples Josh sent from Adelaide today.

Thanks

**James Coley**
*Senior Environmental Consultant*

GOLDER

Golder Associates Pty Ltd
118 Franklin Street, Adelaide, South Australia 5000, Australia
**T:** +61 8 8213 2100 | **D:** 08 8213 2106 | **M:** 0433 336 006 | **golder.com**

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**Best Consulting Engineering Firm (revenue > A$200m)**

**Winner of 29 Financial Review Client Choice Awards**

# Chain of Custody Record

Golder Associates Pty Ltd
118 Franklin Street,

GOLDER

| | | | |
|---|---|---|---|
| **PROJECT:** | Albert Park | **DATE REQUIRED:** | Standard |
| **PROJ No.:** | 19131233 | **E-MAIL RESULTS:** | jcoley@golder.com.au |
| **SAMPLED BY:** | James Coley | **CC RESULTS:** | SAContaminatedLandGroup@golder.com |
| **CONTACT:** | " | | |
| **LABORATORY:** | ALS | **QUOTE No:** | |

**Analyses Required X**

| Laboratory ID | Field ID | Date Sampled | Number of Containers | TBA | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GW01 | 21.11.19 | 12 | | | | | | | | | | | |
| | GW02 | | 12 | | | | | | | | | | | |
| | GW03 | | 12 | | | | | | | | | | | |
| | GW04 | | 12 | | | | | | | | | | | |
| | GW05 | | 12 | | | | | | | | | | | |
| | R01 | | 8 | | | | | | | | | | | |
| | TB01 | | 1 | | | | | | | | | | | |
| | DUP1A | | 12 | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | **Totals** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Any samples heavily contaminated?** No

***NOTE:***
**COC with analysis to be sent 22/11/2019**

| | Name | Organisation | Samples Intact? | Samples Chilled? | Date | Time | Signature |
|---|---|---|---|---|---|---|---|
| RELEASED BY: | Josh Innes | Golder Associates | (Yes) | (Yes) | 21/11/19 | 3:30 | |
| RECEIVED BY: | | | *Esky Intact* | *Security Seals Intact* | | | |
| | | | *Yes / No* | *Yes / No* | | | |
| RELEASED BY: | | | *Yes / No* | *Yes / No* | | | |
| RECEIVED BY: | | | *Esky Intact* | *Security Seals Intact* | | | |
| | | | *Yes / No* | *Yes / No* | | | |

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **EN1907948** | Page | : 1 of 4 |
| Client | : **GOLDER ASSOCIATES** | Laboratory | : Environmental Division Newcastle |
| Contact | : JAMES COLEY | Contact | : |
| Address | : Level 3, 118 Franklin Street<br>ADELAIDE SA, AUSTRALIA 5000 | Address | : 5/585 Maitland Road Mayfield West NSW Australia 2304 |
| Telephone | : ---- | Telephone | : +61 2 4014 2500 |
| Project | : 19131233 Albert Park | Date Samples Received | : 08-Nov-2019 09:05 |
| Order number | : PO24024 | Date Analysis Commenced | : 11-Nov-2019 |
| C-O-C number | : ---- | Issue Date | : 13-Nov-2019 14:19 |
| Sampler | : J I | | |
| Site | : ---- | | |
| Quote number | : EN/002/18 National BQ | | |
| No. of samples received | : 1 | | |
| No. of samples analysed | : 1 | | |

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

| *Signatories* | *Position* | *Accreditation Category* |
|---|---|---|
| Dale Semple | Analyst | Newcastle - Organics, Mayfield West, NSW |
| Daniel Junek | Senior Air Analyst | Newcastle - Organics, Mayfield West, NSW |
| Daniel Junek | Senior Air Analyst | Newcastle, Mayfield West, NSW |

## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP101: Results reported in mg/m³ are calculated from PPMV results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa.
- CAN-001: Results for Pressure - As Received are measured under controlled conditions using calibrated laboratory gauges. These results are expressed as an Absolute Pressure. Equivalent gauge pressures may be calculated by subtracting the Pressure - Laboratory Atmosphere taken at the time of measurement.
- CAN-001: Results for Pressure - Gauge as Received are obtained from uncalibrated field gauges and are indicative only. These results may not precisely match calibrated gauge readings and may vary from field measurements due to changes in temperature and pressure
- EP104: Results reported in mg/m³ are calculated from Mol% results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa
- EP104: Sample canisters were received at sub-ambient pressures and required dilution in the laboratory prior to analysis. LOR values have been adjusted accordingly

## Analytical Results

| Sub-Matrix: SOIL GAS (Matrix: AIR) | | | | Client sample ID | SV13-R2 C873_S207 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | 05-Nov-2019 00:00 | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | EN1907948-001 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EP101: VOCs by USEPA Method TO15 (Calculated Concentration)** | | | | | | | | | |
| **Vinyl chloride** | 75-01-4 | 0.0051 | mg/m³ | | <0.0051 | ---- | ---- | ---- | ---- |
| **1.1-Dichloroethene** | 75-35-4 | 0.200 | mg/m³ | | <0.200 | ---- | ---- | ---- | ---- |
| **1.1-Dichloroethane** | 75-34-3 | 0.200 | mg/m³ | | <0.200 | ---- | ---- | ---- | ---- |
| **cis-1.2-Dichloroethene** | 156-59-2 | 0.0200 | mg/m³ | | <0.0200 | ---- | ---- | ---- | ---- |
| **Trichloroethene** | 79-01-6 | 0.0050 | mg/m³ | | **0.854** | ---- | ---- | ---- | ---- |
| **Tetrachloroethene** | 127-18-4 | 0.340 | mg/m³ | | <0.340 | ---- | ---- | ---- | ---- |
| **trans-1.2-Dichloroethene** | 156-60-5 | 0.200 | mg/m³ | | <0.200 | ---- | ---- | ---- | ---- |
| **EP101: VOCs by USEPA Method TO15r** | | | | | | | | | |
| **Vinyl chloride** | 75-01-4 | 0.0020 | ppmv | | <0.0020 | ---- | ---- | ---- | ---- |
| **1.1-Dichloroethene** | 75-35-4 | 0.0500 | ppmv | | <0.0500 | ---- | ---- | ---- | ---- |
| **1.1-Dichloroethane** | 75-34-3 | 0.0500 | ppmv | | <0.0500 | ---- | ---- | ---- | ---- |
| **cis-1.2-Dichloroethene** | 156-59-2 | 0.0050 | ppmv | | <0.0050 | ---- | ---- | ---- | ---- |
| **Trichloroethene** | 79-01-6 | 0.0010 | ppmv | | **0.159** | ---- | ---- | ---- | ---- |
| **Tetrachloroethene** | 127-18-4 | 0.0500 | ppmv | | <0.0500 | ---- | ---- | ---- | ---- |
| **trans-1.2-Dichloroethene** | 156-60-5 | 0.0500 | ppmv | | <0.0500 | ---- | ---- | ---- | ---- |
| **EP104: Permanent Gases** | | | | | | | | | |
| **Helium** | 7440-59-7 | 0.005 | Mol % | | <0.012 | ---- | ---- | ---- | ---- |
| **EP104: Permanent Gases (Calc Conc)** | | | | | | | | | |
| **Helium** | 7440-59-7 | 8 | mg/m³ | | <20 | ---- | ---- | ---- | ---- |
| **Sampling Quality Assurance** | | | | | | | | | |
| **Pressure - As received** | PRESSURE | 0.1 | kPaa | | **76.0** | ---- | ---- | ---- | ---- |
| **Pressure - Laboratory Atmosphere** | ---- | 0.1 | kPaa | | **102** | ---- | ---- | ---- | ---- |
| **Temperature as Received** | ---- | 0.1 | °C | | **20.0** | ---- | ---- | ---- | ---- |
| **Vacuum - As received** | ---- | 0.03 | Inches Hg | | **7.56** | ---- | ---- | ---- | ---- |
| **USEPA Air Toxics Method TO15r Surrogates** | | | | | | | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 0.5 | % | | **95.8** | ---- | ---- | ---- | ---- |

## Surrogate Control Limits

| Sub-Matrix: **SOIL GAS** | | Recovery Limits (%) | |
|---|---|---|---|
| *Compound* | *CAS Number* | *Low* | *High* |
| **USEPA Air Toxics Method TO15r Surrogates** | | | |
| **4-Bromofluorobenzene** | 460-00-4 | 60 | 140 |

Batch AS AN

Tell: AXMK001253

# AIR CANISTER CHAIN OF CUSTODY

ALS

*If sourced from an ALS Laboratory: please tick →*

*Client Supplied Canister(s)?* Y / (N)

| | | | |
|---|---|---|---|
| CLIENT: Golder | TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date): | LABORATORY USE ONLY: (Circle) Received: Date and time | |
| OFFICE: Adelaide | (Standard TAT may be extended for multiple sequential analysis suites) ☐ Non Standard or urgent TAT (List due date): | Custody Seal Intact? Rec Lab Y / N - NE Y / N - (N/A) | |
| PROJECT: Albert Park PROJECT NO: 19131233 | ALS QUOTE NO.: | COC SEQUENCE NUMBER (Circle) | Valves closed on Receipt? Rec Lab Y / N - NE Y / N - (N/A) |
| CANISTER REQUEST NO: PURCHASE ORDER NO.: | COUNTRY OF ORIGIN: | COC: (1) 2 3 4 5 6 7 | Canister/Sampler Complete and Not Damaged: (Yes) / No |
| PROJECT MANAGER: James Coley | CONTACT PH: 8213 2100 | OF: (1) 2 3 4 5 6 7 | Other comment: Temperature °C |
| SAMPLER: JI | SAMPLER MOBILE: 0402 690 676 | RELINQUISHED BY: 6/11/19 3PM | RELINQUISHED BY: 6/11/19 |
| COC Emailed to ALS? (YES / NO) JColey@Golder.com.au | EDD FORMAT (or default): | RECEIVED BY: | RECEIVED BY: 6/11/19 9:05 |
| Email Reports to (will default to PM if no other addresses are listed): SAContaminatedland@golder.com.au | | | |
| Email Invoice to (will default to PM if no other addresses are listed): JColey@golder.com.au | | | |

COMMENTS/SPECIAL HANDLING/REPLACEMENT OR RETURN INSTRUCTIONS: 6 lit, 10-420 3-10 µ

## GAS SAMPLE CONTAINER INFORMATION

## Canister Gauge Pressures (PSI)

Refer to Canister Verification Reports and COAs for pressures measured by the Lab

## ANALYSES REQUESTED

Suite Codes must be listed to attract suite price

## Additional Information

Comments on LORs required, potential hazards, likely contaminant levels, or samples requiring specific QC analysis etc. (LOR defaults to routine method LOR after dilution)

| ALS USE ONLY | CANISTER / SAMPLE DETAILS | | | | | Pre-Sampling | Post Sampling | Reporting Requirements: LORs | | | Units | | Helium | TO15 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LAB ID | CANISTER SERIAL NO. | FLOW CONTROLLER SERIAL NO. | CLIENT SAMPLE ID | DATE / TIME SAMPLED | MATRIX (eg Air, Soil Gas) | | | Ambient Air | Soil Gas (NEPM) | Other / Indoor | ppbv, µg/m³ | ppmv, mg/m³ | | | | | | | |
| | 873 | 207 | SV13 - R2 | 5.11.19 | Gas | -29 | -7 | | | | | | X | | | | | | |

Environmental Division
Newcastle
Work Order Reference
EN1907948

Telephone : +61 2 4014 2500

*Job Specific Instructions:*

DISPATCH RECORD

*Inquiries: Client Services - Newcastle* **Phone: +61 (02) 4014 2500** E-mail: alsenviro.newcastle@alsglobal.com

| Dispatch to: | | ALS Use ONLY | |
|---|---|---|---|
| Client / Office: | Golder | Request Received By: | DB 22/10/19 |
| Contact: | James Coley | Deliver By: | 1/11/19 |
| Telephone: | 0433 336 006 | Dispatched By: | 29/10/19 |
| ALS Quotation: | 19131233 | Workorder: | |
| Delivery Address: | 118 Franklin Street | Agreed Rent Free Period: | 21 days |
| | Adelaide SA 5000 | | |

SPECIAL INSTRUCTIONS:.....

# Sampling Equipment Request

## CANISTERS

| No | Canister Type | Size | Gauge | Valve | Cap | Rental[1] | Analysts Initials & Date: Leak Checked | Certified OK |
|---|---|---|---|---|---|---|---|---|
| 1 | Minican™ | 1.4L | No | QT | Yes | $120 ea | PF | 28/10/19 |

## CONNECTORS AND FLOW CONTROL DEVICES

| No | Equipment Type | Duration (hrs) | Flow (ml/min) | T-Piece | Gauge | Certified | Sealed / Vacuum | Connection Q Quick Connect S Swagelok | | Rental[1] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Soil Gas Sampling Train | | 60 | No | Yes | Yes | Yes / Yes | Q | | Incl Above |
| 1 | Female QT Connectors | - | - | - | - | - | - | Q | | $120 ea. Replacement |
| 1 | Male QT Connector | - | - | - | - | - | - | Q | | $120 ea. Replacement |
| 1 | Pressure Gauge - QT | - | - | - | - | - | Yes / Yes | Q | | $250 ea. Replacement |
| 1 | Sampling Kit Case – Soil Gas | - | - | - | - | - | Yes | NA | | $200 Replacement |

☐ Other (specify) _____

[1] *Refer to Acceptance of Terms*

| ALS use only | | | |
|---|---|---|---|
| Sampling Guide Included (Y/N) | Packed by: PF | | Dispatch Time / Date 28/10/19 |
| Number of Boxes: 1 | | Consignment Note Number: [redacted] ECN101012194 | |
| Courier / Dispatcher: TNT | | Consignment Dispatched by: MM | |



DISPATCH RECORD

AIR SAMPLING EQUIPMENT

## ALS SUPPLIED EQUIPMENT

| Item | Quantity | Item Description | Serial Nos |
|---|---|---|---|
|  | 1 | 1.4 L Silonite Mini-Can with QT Valve | 873 / |
|  | | Soil Gas Sampling Train (Compact Micro) with QT Connections (#3, 60mL) | S 207 / |
|  | 1 | Vacuum Gauge with female QT Connection (-31 Hg) | 9.000 / |
|  | 1 | Female QT to ¼" tube connector | / |
|  | 1 | Male QT to ¼" tube connector | / |

ENFMCDR1.1 11-05-11

RIGHT SOLUTIONS

Brisbane · Adelaide · Bendigo · Canberra · Geelong · Gladstone · Melbourne (Scoresby) · Melbourne (Springvale) · Mudgee · Newcastle · Nowra · Perth · Wollongong · Sydney · Townsville · Traralgon · Wangaratta

www.alsglobal.com

# Chain of Custody Record

Golder Associates Pty Ltd
118 Franklin Street,
Adelaide,

GOLDER

| | | | |
|---|---|---|---|
| **PROJECT:** | Albert Park | **DATE RESULTS REQUIRED:** | Standard |
| **PROJ No.:** | 19131233 | **E-MAIL RESULTS:** | Jinnes@golder.com.au |
| **SAMPLED BY:** | JI | **CC RESULTS:** | SAContaminatedLandGroup@golder.com |
| **CONTACT:** | James Coley | | Jcoley@golder.com.au |
| **LABORATORY:** | SGS | **QUOTE No:** | |

| Laboratory ID | Field ID | Date Sampled | Sample Type | Fill / Natural | Analyses Required X: 1,1-Dichloroethene, cis-1,2-Dichloroethene, trans-1,2-dichloroethene, Trichloroethene, Tetrachloroethene | Vinyl chloride | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | WMS-DUPB | 6/11/2019 | WMS | - | X | X | | | | | | | |
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| | | | | **Totals :** | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Any samples heavily contaminated?** No

*NOTE:*

| | Name | Organisation | Samples Intact? | Samples Chilled? | Date | Time | Signature |
|---|---|---|---|---|---|---|---|
| RELEASED BY: | Josh Innes | Golder Associates | Yes | Yes | 6/11/19 | 1 PM | |
| RECEIVED BY: | N. Saunder | SGS | ***Esky Intact*** Yes / No | ***Security Seals Intact*** Yes / No | 7/11/19 | 11:00am | |
| RELEASED BY: | | | Yes / No | Yes / No | | | |
| RECEIVED BY: | | | ***Esky Intact*** Yes / No | ***Security Seals Intact*** Yes / No | | | |

A.B.N. 44 000 964 278
10 / 585 Blackburn Road
Notting Hill, Vic, 3168
Telephone: (03) 9574 3200

Chartered Chemists

**14-Nov-2019**

**REPORT NUMBER: M191669**

Site/Client Ref: Albert Park - 19131233

Order No: 19131233

**Golder Associates**

**118 Franklin Street**
**Adelaide**
**SA 5000**
**Attention: James Coley**

# CERTIFICATE OF ANALYSIS

| | |
|---|---|
| **SAMPLES:** | One sample was received for analysis |
| **DATE RECEIVED:** | **7-Nov-2019** |
| **DATE COMMENCED:** | **7-Nov-2019** |
| **METHODS:** | See Attached Results |
| **RESULTS:** | Please refer to attached pages for results. |

Note: Results are based on samples as received at SGS laboratories

**REPORTED BY:**

**Adam Atkinson**
Australian Chemistry Manager

NATA Accredited Laboratory Number: 2562
Corporate Site Number: 14420
Accredited for compliance
with ISO/IEC 17025 - Testing.

# ANALYTICAL RESULTS

**Matrix: Passive Sampler**
**Method: MA-5.WL.04 Volatile Organics**
Sample units are expressed in µg/m³ Test Started: 11-Nov-19

| Analyte Name | Sampled Date / PQL | Leeder ID: 2019024969<br>Client ID: WMS-DUPB<br>06-Nov-19 |
|---|---|---|
| 1,1-Dichloroethene | | <22 |
| cis-1,2-Dichloroethene | | <9.5 |
| trans-1,2-Dichloroethene | | <9.9 |
| Tetrachloroethene | | <4.5 |
| Trichloroethene | | 6.4 |
| Vinyl Chloride | | <36 |

**Matrix: Passive Sampler**
**Method: MA-5.WL.03 Volatile Organics**
Sample units are expressed in µg total Test Started: 11-Nov-19

| Analyte Name | Sampled Date / PQL | Leeder ID: 2019024970<br>Client ID: Method<br>Blank |
|---|---|---|
| 1,1-Dichloroethene | 0.05 | nd |
| cis-1,2-Dichloroethene | 0.05 | nd |
| trans-1,2-Dichloroethene | 0.05 | nd |
| Tetrachloroethene | 0.05 | nd |
| Trichloroethene | 0.05 | nd |
| Vinyl Chloride | 0.05 | nd |

## QUALIFIERS / NOTES FOR REPORTED RESULTS

| | |
|---|---|
| PQL | Practical Quantitation Limit |
| nd | Not Detected – The analyte was not detected above the reported PQL. |
| *is* | Insufficient Sample to perform this analysis. |
| T | Tentative identification based on computer library search of mass spectra. |
| NC | Not calculated and/or Results below PQL |
| NV | No Vacuum, Canister received above standard atmospheric pressure |
| *nr* | Not Requested for analysis. |
| R | Rejected Result – results for this analysis failed QC checks. |
| SQ | Semi-Quantitative result – quantitation based on a generic response factor for this class of analyte. |
| IM | Inappropriate method of analysis for this compound |
| U | Unable to provide Quality Control data – high levels of compounds in sample interfered with analysis of QC results. |
| UF | Unable to provide Quality Control data- Surrogates failed QC checks due to sample matrix effects |
| L | Analyte detected at a level above the linear response of calibration curve. |
| E | Estimated result. NATA accreditation does not cover estimated results. |
| C1 | These compounds co-elute. |
| -- | Parameter Not Determined |
| CT | Elevated concentration. Results reported from carbon tube analysis |
| ** | Sample shows non-petroleum hydrocarbon profile |

**APPENDIX ONE.**

CHAIN OF CUSTODY DOCUMENT

# Chain of Custody Record

Golder Associates Pty Ltd
118 Franklin Street,
Adelaide,

GOLDER

| | | | |
|---|---|---|---|
| **PROJECT:** | Albert Park | **DATE RESULTS REQUIRED:** | Standard |
| **PROJ No.:** | 19131233 | **E-MAIL RESULTS:** | Jinnes@golder.com.au |
| **SAMPLED BY:** | JI | **CC RESULTS:** | SAContaminatedLandGroup@golder.com |
| **CONTACT:** | James Coley | | Jcoley@golder.com.au |
| **LABORATORY:** | SGS | **QUOTE No:** | |

| Laboratory ID | Field ID | Date Sampled | Sample Type | Fill / Natural | Analyses Required X: 1,1-Dichloroethene, cis-1,2-Dichloroethene, trans-1,2-dichloroethene, Trichloroethene, Tetrachloroethene | Vinyl chloride | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | WMS-DUPB | 6/11/2019 | WMS | - | X | X | | | | | | | |
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| | | | | **Totals :** | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Any samples heavily contaminated?** No

*NOTE:*

| | Name | Organisation | Samples Intact? | Samples Chilled? | Date | Time | Signature |
|---|---|---|---|---|---|---|---|
| RELEASED BY: | Josh Innes | Golder Associates | Yes | Yes | 6/11/19 | 1 PM | |
| RECEIVED BY: | N. Saunder | SGS | ***Esky Intact*** Yes / No | ***Security Seals Intact*** Yes / No | 7/11/19 | 11:00am | |
| RELEASED BY: | | | Yes / No | Yes / No | | | |
| RECEIVED BY: | | | ***Esky Intact*** Yes / No | ***Security Seals Intact*** Yes / No | | | |

**APPENDIX L**

# VIRA Outputs

GOLDER

| TABLE L1 | |
|---|---|
| **BUILDING TYPE:** | RESIDENTIAL |
| | SLAB ON GRADE |

| | Volatile Organic Compounds | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | cis-1,2-Dichloroethene | | | | Trichloroethene | | | |
| | Soil Vapour (mg/m3) | Attenuation Factor (α) | Predicted Indoor Air Concentration (mg/m3) | Response Range Upper Limit | Soil Vapour (mg/m3) | Attenuation Factor (α) | Predicted Indoor Air Concentration (mg/m3) | Response Range Upper Limit |
| ***INDOOR AIR LEVEL RESPONSE RANGES*** | | ***9.69E-04*** | | | | ***7.87E-04*** | | |
| **No Action** | | | ***Non Detect*** | | | | ***Non Detect*** | |
| **Validation** | | | ***0.007*** | | | | ***0.002*** | |
| **Investigation** | | | ***0.07*** | | | | ***0.02*** | |
| **Intervention** | | | ***0.7*** | | | | ***0.2*** | |
| **Accelerated Intervention** | | | **> 0.7** | | | | **> 0.2** | |

| Sample Location | Depth (mBGL) | Sample ID | Sample Collection Date | Lab Report Number | Data Source / Comment | Sample Type | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Stage 1 & 2 - Active soil vapour samples** | | | | | | | | | | | | | | |
| SV01-S | 1 | SV01-S | 4/11/2019 | 230172 | - | Normal | 0.027 | 9.69E-04 | **0.00003** | **Validation** | ***11*** | 7.87E-04 | **0.00866** | **Investigation** |
| SV01-D | 2 | SV01-D | 4/11/2019 | 230172 | - | Normal | *0.38* | | | | *32* | | | |
| SV02 | 1 | SV02 | 4/11/2019 | 230172 | - | Normal | 0.025 | 9.69E-04 | **0.00002** | **Validation** | ***8.3*** | 7.87E-04 | **0.00653** | **Investigation** |
| SV03-S | 1 | SV03-S | 4/11/2019 | 230172 | - | Normal | 0.09 | 9.69E-04 | **0.00009** | **Validation** | ***18*** | 7.87E-04 | **0.01417** | **Investigation** |
| SV03-D | 2 | SV03-D | 4/11/2019 | 230172 | - | Normal | 0.27 | | | | *42* | | | |
| SV04 | 1 | SV04 | 21/06/2019 | 220270 | JBS&G (2019) | Normal | 0.028 | 9.69E-04 | **0.00003** | **Validation** | ***6.4*** | 7.87E-04 | **0.00504** | **Investigation** |
| SV05 | 1 | SV05 | 21/06/2019 | 220270 | JBS&G (2019) | Normal | <0.0020 | 9.69E-04 | - | ***No Action*** | ***1.3*** | 7.87E-04 | **0.00102** | **Validation** |
| SV06 | 1 | SV06 | 4/11/2019 | 230172 | - | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | ***0.39*** | 7.87E-04 | **0.00031** | **Validation** |
| SV07 | 1 | SV07 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | 0.024 | 7.87E-04 | **0.00002** | **Validation** |
| SV08 | 1 | SV08 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.0066 | 9.69E-04 | - | ***No Action*** | ***4.6*** | 7.87E-04 | **0.00362** | **Investigation** |
| SV09 | 1 | SV09 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | ***0.94*** | 7.87E-04 | **0.00074** | **Validation** |
| SV10 | 1 | SV10 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | 0.02 | 7.87E-04 | **0.00002** | **Validation** |
| SV11 | 1 | SV11 | 4/11/2019 | 230172 | - | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | 0.024 | 7.87E-04 | **0.00002** | **Validation** |
| SV12 | 1 | SV12 | 4/11/2019 | 230172 | - | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | ***0.26*** | 7.87E-04 | **0.00020** | **Validation** |
| SV13 | 1 | SV13 | 5/11/2019 | 230172 | - | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | ***0.75*** | 7.87E-04 | **0.00059** | **Validation** |
| | | SV13-R | 5/11/2019 | 230172 | - | Intralab Dup | <0.002 | 9.69E-04 | - | ***No Action*** | *0.81* | 7.87E-04 | **0.00064** | **Validation** |
| | | SV13-R2 | 5/11/2019 | EN1907948 | - | Interlab Dup | <0.0200 | 9.69E-04 | - | ***No Action*** | *0.854* | 7.87E-04 | **0.00067** | **Validation** |
| SV14 | 1 | SV14 | 5/11/2019 | 230172 | - | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | ***3.9*** | 7.87E-04 | **0.00307** | **Investigation** |
| SV15 | 1 | SV15 | 5/11/2019 | 230172 | - | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | 0.038 | 7.87E-04 | **0.00003** | **Validation** |
| SV16 | 1 | SV16 | 5/11/2019 | 230172 | - | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | ***0.16*** | 7.87E-04 | **0.00013** | **Validation** |
| SV17 | 1 | SV17 | 5/11/2019 | 230172 | - | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | <0.0016 | 7.87E-04 | - | ***No Action*** |
| SV18 | 1 | SV18 | 5/11/2019 | 230172 | - | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | ***0.25*** | 7.87E-04 | **0.00020** | **Validation** |
| SV19 | 1 | SV19 | 5/11/2019 | 230172 | - | Normal | <0.002 | 9.69E-04 | - | ***No Action*** | ***0.18*** | 7.87E-04 | **0.00014** | **Validation** |

GOLDER

| TABLE L2 | |
|---|---|
| **BUILDING TYPE:** | RESIDENTIAL |
| | CRAWL SPACE |

| | | | | | | | Volatile Organic Compounds | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | cis-1,2-Dichloroethene | | | | Trichloroethene | | | |
| | | | | | | | Soil Vapour (mg/m3) | Attenuation Factor (α) | Predicted Indoor Air Concentration (mg/m3) | Response Range Upper Limit | Soil Vapour (mg/m3) | Attenuation Factor (α) | Predicted Indoor Air Concentration (mg/m3) | Response Range Upper Limit |
| ***INDOOR AIR LEVEL RESPONSE RANGE*** | | | | | | | | ***1.04E-03*** | | | | ***8.06E-04*** | | |
| **No Action** | | | | | | | | | ***Non Detect*** | | | | ***Non Detect*** | |
| **Validation** | | | | | | | | | ***0.007*** | | | | ***0.002*** | |
| **Investigation** | | | | | | | | | ***0.07*** | | | | ***0.02*** | |
| **Intervention** | | | | | | | | | ***0.7*** | | | | ***0.2*** | |
| **Accelerated Intervention** | | | | | | | | | **> 0.7** | | | | **> 0.2** | |
| **Sample Location** | **Depth (mBGL)** | **Sample ID** | **Sample Collection Date** | **Lab Report Number** | **Data Source / Comment** | **Sample Type** | | | | | | | | |
| **Stage 1 & 2 - Active soil vapour samples** | | | | | | | | | | | | | | |
| SV01-S | 1 | SV01-S | 4/11/2019 | 230172 | - | Normal | 0.027 | 1.04E-03 | **0.00003** | **Validation** | ***11*** | 8.06E-04 | **0.00887** | **Investigation** |
| SV01-D | 2 | SV01-D | 4/11/2019 | 230172 | - | Normal | *0.38* | | | | *32* | | | |
| SV02 | 1 | SV02 | 4/11/2019 | 230172 | - | Normal | 0.025 | 1.04E-03 | **0.00003** | **Validation** | ***8.3*** | 8.06E-04 | **0.00669** | **Investigation** |
| SV03-S | 1 | SV03-S | 4/11/2019 | 230172 | - | Normal | 0.09 | 1.04E-03 | **0.00009** | **Validation** | ***18*** | 8.06E-04 | **0.01451** | **Investigation** |
| SV03-D | 2 | SV03-D | 4/11/2019 | 230172 | - | Normal | 0.27 | | | | *42* | | **0.00000** | |
| SV04 | 1 | SV04 | 21/06/2019 | 220270 | JBS&G (2019) | Normal | 0.028 | 1.04E-03 | **0.00003** | **Validation** | ***6.4*** | 8.06E-04 | **0.00516** | **Investigation** |
| SV05 | 1 | SV05 | 21/06/2019 | 220270 | JBS&G (2019) | Normal | <0.0020 | 1.04E-03 | - | ***No Action*** | ***1.3*** | 8.06E-04 | **0.00105** | **Validation** |
| SV06 | 1 | SV06 | 4/11/2019 | 230172 | - | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | ***0.39*** | 8.06E-04 | **0.00031** | **Validation** |
| SV07 | 1 | SV07 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | 0.024 | 8.06E-04 | **0.00002** | **Validation** |
| SV08 | 1 | SV08 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.0066 | 1.04E-03 | - | ***No Action*** | ***4.6*** | 8.06E-04 | **0.00371** | **Investigation** |
| SV09 | 1 | SV09 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | ***0.94*** | 8.06E-04 | **0.00076** | **Validation** |
| SV10 | 1 | SV10 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | 0.02 | 8.06E-04 | **0.00002** | **Validation** |
| SV11 | 1 | SV11 | 4/11/2019 | 230172 | - | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | 0.024 | 8.06E-04 | **0.00002** | **Validation** |
| SV12 | 1 | SV12 | 4/11/2019 | 230172 | - | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | ***0.26*** | 8.06E-04 | **0.00021** | **Validation** |
| SV13 | 1 | SV13 | 5/11/2019 | 230172 | - | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | ***0.75*** | 8.06E-04 | **0.00060** | **Validation** |
| | | SV13-R | 5/11/2019 | 230172 | - | Intralab Dup | <0.002 | 1.04E-03 | - | ***No Action*** | *0.81* | 8.06E-04 | **0.00065** | **Validation** |
| | | SV13-R2 | 5/11/2019 | EN1907948 | - | Interlab Dup | <0.0200 | 1.04E-03 | - | ***No Action*** | *0.854* | 8.06E-04 | **0.00069** | **Validation** |
| SV14 | 1 | SV14 | 5/11/2019 | 230172 | - | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | ***3.9*** | 8.06E-04 | **0.00314** | **Investigation** |
| SV15 | 1 | SV15 | 5/11/2019 | 230172 | - | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | 0.038 | 8.06E-04 | **0.00003** | **Validation** |
| SV16 | 1 | SV16 | 5/11/2019 | 230172 | - | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | ***0.16*** | 8.06E-04 | **0.00013** | **Validation** |
| SV17 | 1 | SV17 | 5/11/2019 | 230172 | - | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | <0.0016 | 8.06E-04 | - | ***No Action*** |
| SV18 | 1 | SV18 | 5/11/2019 | 230172 | - | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | ***0.25*** | 8.06E-04 | **0.00020** | **Validation** |
| SV19 | 1 | SV19 | 5/11/2019 | 230172 | - | Normal | <0.002 | 1.04E-03 | - | ***No Action*** | ***0.18*** | 8.06E-04 | **0.00015** | **Validation** |

GOLDER

| TABLE L3 | |
|---|---|
| BUILDING TYPE: | RESIDENTIAL |
| | BASEMENT |

| | | | | | | | Volatile Organic Compounds | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | cis-1,2-Dichloroethene | | | | Trichloroethene | | | |
| | | | | | | | Soil Vapour (mg/m3) | Attenuation Factor (α) | Predicted Indoor Air Concentration (mg/m3) | Response Range Upper Limit | Soil Vapour (mg/m3) | Attenuation Factor (α) | Predicted Indoor Air Concentration (mg/m3) | Response Range Upper Limit |
| ***INDOOR AIR LEVEL RESPONSE RANGE*** | | | | | | | | ***3.98E-03*** | | | | ***3.76E-03*** | | |
| **No Action** | | | | | | | | | ***Non Detect*** | | | | ***Non Detect*** | |
| **Validation** | | | | | | | | | ***0.007*** | | | | ***0.002*** | |
| **Investigation** | | | | | | | | | ***0.07*** | | | | ***0.02*** | |
| **Intervention** | | | | | | | | | ***0.7*** | | | | ***0.2*** | |
| **Accelerated Intervention** | | | | | | | | | **> 0.7** | | | | **> 0.2** | |
| **Sample Location** | **Depth (mBGL)** | **Sample ID** | **Sample Collection Date** | **Lab Report Number** | **Data Source / Comment** | **Sample Type** | | | | | | | | |
| **Stage 1 & 2 - Active soil vapour samples** | | | | | | | | | | | | | | |
| SV01-S | 1 | SV01-S | 4/11/2019 | 230172 | - | Normal | 0.027 | 3.98E-03 | **0.00011** | **Validation** | ***11*** | 3.76E-03 | **0.04136** | **Intervention** |
| SV01-D | 2 | SV01-D | 4/11/2019 | 230172 | - | Normal | *0.38* | 3.98E-03 | **0.00151** | **Validation** | *32* | 3.76E-03 | **0.12032** | **Intervention** |
| SV02 | 1 | SV02 | 4/11/2019 | 230172 | - | Normal | 0.025 | 3.98E-03 | **0.00010** | **Validation** | ***8.3*** | 3.76E-03 | **0.03121** | **Intervention** |
| SV03-S | 1 | SV03-S | 4/11/2019 | 230172 | - | Normal | 0.09 | 3.98E-03 | **0.00036** | **Validation** | ***18*** | 3.76E-03 | **0.06768** | **Intervention** |
| SV03-D | 2 | SV03-D | 4/11/2019 | 230172 | - | Normal | 0.27 | 3.98E-03 | **0.00107** | **Validation** | *42* | 3.76E-03 | **0.15792** | **Intervention** |
| SV04 | 1 | SV04 | 21/06/2019 | 220270 | JBS&G (2019) | Normal | 0.028 | 3.98E-03 | **0.00011** | **Validation** | ***6.4*** | 3.76E-03 | **0.02406** | **Intervention** |
| SV05 | 1 | SV05 | 21/06/2019 | 220270 | JBS&G (2019) | Normal | <0.0020 | 3.98E-03 | - | ***No Action*** | ***1.3*** | 3.76E-03 | **0.00489** | **Investigation** |
| SV06 | 1 | SV06 | 4/11/2019 | 230172 | - | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | ***0.39*** | 3.76E-03 | **0.00147** | **Validation** |
| SV07 | 1 | SV07 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | 0.024 | 3.76E-03 | **0.00009** | **Validation** |
| SV08 | 1 | SV08 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.0066 | 3.98E-03 | - | ***No Action*** | ***4.6*** | 3.76E-03 | **0.01730** | **Investigation** |
| SV09 | 1 | SV09 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | ***0.94*** | 3.76E-03 | **0.00353** | **Investigation** |
| SV10 | 1 | SV10 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | 0.02 | 3.76E-03 | **0.00008** | **Validation** |
| SV11 | 1 | SV11 | 4/11/2019 | 230172 | - | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | 0.024 | 3.76E-03 | **0.00009** | **Validation** |
| SV12 | 1 | SV12 | 4/11/2019 | 230172 | - | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | ***0.26*** | 3.76E-03 | **0.00098** | **Validation** |
| SV13 | 1 | SV13 | 5/11/2019 | 230172 | - | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | ***0.75*** | 3.76E-03 | **0.00282** | **Investigation** |
| | | SV13-R | 5/11/2019 | 230172 | - | Intralab Dup | <0.002 | 3.98E-03 | - | ***No Action*** | *0.81* | 3.76E-03 | **0.00305** | **Investigation** |
| | | SV13-R2 | 5/11/2019 | EN1907948 | - | Interlab Dup | <0.0200 | 3.98E-03 | - | ***No Action*** | *0.854* | 3.76E-03 | **0.00321** | **Investigation** |
| SV14 | 1 | SV14 | 5/11/2019 | 230172 | - | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | ***3.9*** | 3.76E-03 | **0.01466** | **Investigation** |
| SV15 | 1 | SV15 | 5/11/2019 | 230172 | - | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | 0.038 | 3.76E-03 | **0.00014** | **Validation** |
| SV16 | 1 | SV16 | 5/11/2019 | 230172 | - | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | ***0.16*** | 3.76E-03 | **0.00060** | **Validation** |
| SV17 | 1 | SV17 | 5/11/2019 | 230172 | - | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | <0.0016 | 3.76E-03 | - | ***No Action*** |
| SV18 | 1 | SV18 | 5/11/2019 | 230172 | - | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | ***0.25*** | 3.76E-03 | **0.00094** | **Validation** |
| SV19 | 1 | SV19 | 5/11/2019 | 230172 | - | Normal | <0.002 | 3.98E-03 | - | ***No Action*** | ***0.18*** | 3.76E-03 | **0.00068** | **Validation** |

GOLDER

| TABLE L4 | |
|---|---|
| BUILDING TYPE: | COMMERCIAL |
| | SLANB ON GRADE |

| | Volatile Organic Compounds | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | cis-1,2-Dichloroethene | | | | | Trichloroethene | | | | |
| | Soil Vapour (mg/m3) | Attenuation Factor (α) | Exposure Scaling | Predicted Indoor Air Concentration (mg/m3) | Response Range Upper Limit | Soil Vapour (mg/m3) | Attenuation Factor (α) | Exposure Scaling | Predicted Indoor Air Concentration (mg/m3) | Response Range Upper Limit |
| ***INDOOR AIR LEVEL RESPONSE RANGE*** | | ***6.41E-04*** | ***10*** | | | | ***5.13E-04*** | ***10*** | | |
| **No Action** | | | | ***Non Detect*** | | | | | ***Non Detect*** | |
| **Validation** | | | | ***0.007*** | | | | | ***0.002*** | |
| **Investigation** | | | | ***0.07*** | | | | | ***0.02*** | |
| **Intervention** | | | | ***0.7*** | | | | | ***0.2*** | |
| **Accelerated Intervention** | | | | **> 0.7** | | | | | **> 0.2** | |

| Sample Location | Depth (mBGL) | Sample ID | Sample Collection Date | Lab Report Number | Data Source / Comment | Sample Type | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Stage 1 & 2 - Active soil vapour samples** | | | | | | | | | | | | | | | | |
| SV01-S | 1 | SV01-S | 4/11/2019 | 230172 | - | Normal | 0.027 | 6.41E-04 | 10 | **0.000002** | **Validation** | ***11*** | 5.13E-04 | 10 | **0.000564** | **Validation** |
| SV01-D | 2 | SV01-D | 4/11/2019 | 230172 | - | Normal | *0.38* | | | | | *32* | | | | |
| SV02 | 1 | SV02 | 4/11/2019 | 230172 | - | Normal | 0.025 | 6.41E-04 | 10 | **0.000002** | **Validation** | ***8.3*** | 5.13E-04 | 10 | **0.000426** | **Validation** |
| SV03-S | 1 | SV03-S | 4/11/2019 | 230172 | - | Normal | 0.09 | 6.41E-04 | 10 | **0.000006** | **Validation** | ***18*** | 5.13E-04 | 10 | **0.000923** | **Validation** |
| SV03-D | 2 | SV03-D | 4/11/2019 | 230172 | - | Normal | 0.27 | | | | | *42* | | | | |
| SV04 | 1 | SV04 | 21/06/2019 | 220270 | JBS&G (2019) | Normal | 0.028 | 6.41E-04 | 10 | **0.000002** | **Validation** | ***6.4*** | 5.13E-04 | 10 | **0.000328** | **Validation** |
| SV05 | 1 | SV05 | 21/06/2019 | 220270 | JBS&G (2019) | Normal | <0.0020 | 6.41E-04 | 10 | - | ***No Action*** | ***1.3*** | 5.13E-04 | 10 | **0.000067** | **Validation** |
| SV06 | 1 | SV06 | 4/11/2019 | 230172 | - | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | ***0.39*** | 5.13E-04 | 10 | **0.000020** | **Validation** |
| SV07 | 1 | SV07 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | 0.024 | 5.13E-04 | 10 | **0.000001** | **Validation** |
| SV08 | 1 | SV08 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.0066 | 6.41E-04 | 10 | - | ***No Action*** | ***4.6*** | 5.13E-04 | 10 | **0.000236** | **Validation** |
| SV09 | 1 | SV09 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | ***0.94*** | 5.13E-04 | 10 | **0.000048** | **Validation** |
| SV10 | 1 | SV10 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | 0.02 | 5.13E-04 | 10 | **0.000001** | **Validation** |
| SV11 | 1 | SV11 | 4/11/2019 | 230172 | - | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | 0.024 | 5.13E-04 | 10 | **0.000001** | **Validation** |
| SV12 | 1 | SV12 | 4/11/2019 | 230172 | - | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | ***0.26*** | 5.13E-04 | 10 | **0.000013** | **Validation** |
| SV13 | 1 | SV13 | 5/11/2019 | 230172 | - | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | ***0.75*** | 5.13E-04 | 10 | **0.000038** | **Validation** |
| | | SV13-R | 5/11/2019 | 230172 | - | Intralab Dup | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | ***0.81*** | 5.13E-04 | 10 | **0.000042** | **Validation** |
| | | SV13-R2 | 5/11/2019 | EN1907948 | - | Interlab Dup | <0.0200 | 6.41E-04 | 10 | - | ***No Action*** | ***0.854*** | 5.13E-04 | 10 | **0.000044** | **Validation** |
| SV14 | 1 | SV14 | 5/11/2019 | 230172 | - | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | ***3.9*** | 5.13E-04 | 10 | **0.000200** | **Validation** |
| SV15 | 1 | SV15 | 5/11/2019 | 230172 | - | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | 0.038 | 5.13E-04 | 10 | **0.000002** | **Validation** |
| SV16 | 1 | SV16 | 5/11/2019 | 230172 | - | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | ***0.16*** | 5.13E-04 | 10 | **0.000008** | **Validation** |
| SV17 | 1 | SV17 | 5/11/2019 | 230172 | - | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | <0.0016 | 5.13E-04 | 10 | - | ***No Action*** |
| SV18 | 1 | SV18 | 5/11/2019 | 230172 | - | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | ***0.25*** | 5.13E-04 | 10 | **0.000013** | **Validation** |
| SV19 | 1 | SV19 | 5/11/2019 | 230172 | - | Normal | <0.002 | 6.41E-04 | 10 | - | ***No Action*** | ***0.18*** | 5.13E-04 | 10 | **0.000009** | **Validation** |

GOLDER

| TABLE L5 | |
|---|---|
| **BUILDING TYPE:** | TRENCH / EXCAVATION |
| | WORKER |

| | Volatile Organic Compounds | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | cis-1,2-Dichloroethene | | | | | Trichloroethene | | | | |
| | Soil Vapour (mg/m3) | Attenuation Factor (α) | Exposure Scaling | Predicted Indoor Air Concentration (mg/m3) | Response Range Upper Limit | Soil Vapour (mg/m3) | Attenuation Factor (α) | Exposure Scaling | Predicted Indoor Air Concentration (mg/m3) | Response Range Upper Limit |
| ***INDOOR AIR LEVEL RESPONSE RANGE*** | | ***2.85E-04*** | ***10*** | | | | ***2.21E-04*** | ***10*** | | |
| **No Action** | | | | ***Non Detect*** | | | | | ***Non Detect*** | |
| **Validation** | | | | ***0.007*** | | | | | ***0.002*** | |
| **Investigation** | | | | ***0.07*** | | | | | ***0.02*** | |
| **Intervention** | | | | ***0.7*** | | | | | ***0.2*** | |
| **Accelerated Intervention** | | | | **> 0.7** | | | | | **> 0.2** | |

| Sample Location | Depth (mBGL) | Sample ID | Sample Collection Date | Lab Report Number | Data Source / Comment | Sample Type | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Stage 1 & 2 - Active soil vapour samples** | | | | | | | | | | | | | | | | |
| SV01-S | 1 | SV01-S | 4/11/2019 | 230172 | - | Normal | 0.027 | 2.85E-04 | 10 | **0.000001** | **Validation** | ***11*** | 2.21E-04 | 10 | **0.000243** | **Validation** |
| SV01-D | 2 | SV01-D | 4/11/2019 | 230172 | - | Normal | *0.38* | | | | | *32* | | | | |
| SV02 | 1 | SV02 | 4/11/2019 | 230172 | - | Normal | 0.025 | 2.85E-04 | 10 | **0.000001** | **Validation** | ***8.3*** | 2.21E-04 | 10 | **0.000183** | **Validation** |
| SV03-S | 1 | SV03-S | 4/11/2019 | 230172 | - | Normal | 0.09 | 2.85E-04 | 10 | **0.000003** | **Validation** | ***18*** | 2.21E-04 | 10 | **0.000398** | **Validation** |
| SV03-D | 2 | SV03-D | 4/11/2019 | 230172 | - | Normal | 0.27 | | | | | *42* | | | | |
| SV04 | 1 | SV04 | 21/06/2019 | 220270 | JBS&G (2019) | Normal | 0.028 | 2.85E-04 | 10 | **0.000001** | **Validation** | ***6.4*** | 2.21E-04 | 10 | **0.000141** | **Validation** |
| SV05 | 1 | SV05 | 21/06/2019 | 220270 | JBS&G (2019) | Normal | <0.0020 | 2.85E-04 | 10 | - | ***No Action*** | ***1.3*** | 2.21E-04 | 10 | **0.000029** | **Validation** |
| SV06 | 1 | SV06 | 4/11/2019 | 230172 | - | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | ***0.39*** | 2.21E-04 | 10 | **0.000009** | **Validation** |
| SV07 | 1 | SV07 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | 0.024 | 2.21E-04 | 10 | **0.000001** | **Validation** |
| SV08 | 1 | SV08 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.0066 | 2.85E-04 | 10 | - | ***No Action*** | ***4.6*** | 2.21E-04 | 10 | **0.000102** | **Validation** |
| SV09 | 1 | SV09 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | ***0.94*** | 2.21E-04 | 10 | **0.000021** | **Validation** |
| SV10 | 1 | SV10 | 26/06/2019 | 220470 | JBS&G (2019) | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | 0.02 | 2.21E-04 | 10 | **0.000000** | **Validation** |
| SV11 | 1 | SV11 | 4/11/2019 | 230172 | - | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | 0.024 | 2.21E-04 | 10 | **0.000001** | **Validation** |
| SV12 | 1 | SV12 | 4/11/2019 | 230172 | - | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | ***0.26*** | 2.21E-04 | 10 | **0.000006** | **Validation** |
| SV13 | 1 | SV13 | 5/11/2019 | 230172 | - | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | ***0.75*** | 2.21E-04 | 10 | **0.000017** | **Validation** |
| | | SV13-R | 5/11/2019 | 230172 | - | Intralab Dup | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | *0.81* | 2.21E-04 | 10 | **0.000018** | **Validation** |
| | | SV13-R2 | 5/11/2019 | EN1907948 | - | Interlab Dup | <0.0200 | 2.85E-04 | 10 | - | ***No Action*** | *0.854* | 2.21E-04 | 10 | **0.000019** | **Validation** |
| SV14 | 1 | SV14 | 5/11/2019 | 230172 | - | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | ***3.9*** | 2.21E-04 | 10 | **0.000086** | **Validation** |
| SV15 | 1 | SV15 | 5/11/2019 | 230172 | - | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | 0.038 | 2.21E-04 | 10 | **0.000001** | **Validation** |
| SV16 | 1 | SV16 | 5/11/2019 | 230172 | - | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | ***0.16*** | 2.21E-04 | 10 | **0.000004** | **Validation** |
| SV17 | 1 | SV17 | 5/11/2019 | 230172 | - | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | <0.0016 | 2.21E-04 | 10 | - | ***No Action*** |
| SV18 | 1 | SV18 | 5/11/2019 | 230172 | - | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | ***0.25*** | 2.21E-04 | 10 | **0.000006** | **Validation** |
| SV19 | 1 | SV19 | 5/11/2019 | 230172 | - | Normal | <0.002 | 2.85E-04 | 10 | - | ***No Action*** | ***0.18*** | 2.21E-04 | 10 | **0.000004** | **Validation** |

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100 cm
**FOUNDATION:** Slab on Grade **BUILDING:** Residential

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ ($\mu g/m^3$) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 156592 | 1.00E+00 | | | cis-1,2-Dichloroethylene |

MORE ↓

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ (°C) | ENTER Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ ($cm^2$) |
|---|---|---|---|---|---|---|---|---|
| | | | Totals must add up to value of Ls (cell F24) | | | | | |
| 10 | 100 | 20 | 100 | 0 | 0 | SIC | | |

MORE ↓

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ ($g/cm^3$) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ ($cm^3/cm^3$) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ ($g/cm^3$) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ ($cm^3/cm^3$) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ ($g/cm^3$) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ ($cm^3/cm^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE ↓

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, $\Delta P$ ($g/cm\text{-}s^2$) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 40 | 1500 | 1000 | 240 | 0.3 | 0.6 | 18 | 3600 | 0.005 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 365 |

MORE ↓

| RESULTS α (unitless) |
|---|
| **9.69E-04** |

END

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100 cm
**FOUNDATION:** Slab on Grade **BUILDING:** Residential

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ ($\mu g/m^3$) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 79016 | 1.00E+00 | | | Trichloroethylene |

MORE ↓

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ ($^oC$) | ENTER Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ ($cm^2$) |
|---|---|---|---|---|---|---|---|---|
| | | | Totals must add up to value of Ls (cell F24) | | | | | |
| 10 | 100 | 20 | 100 | 0 | 0 | SIC | | |

MORE ↓

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ ($g/cm^3$) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ ($cm^3/cm^3$) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ ($g/cm^3$) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ ($cm^3/cm^3$) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ ($g/cm^3$) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ ($cm^3/cm^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE ↓

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, $\Delta P$ ($g/cm\text{-}s^2$) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 40 | 1500 | 1000 | 240 | 0.3 | 0.6 | 18 | 3600 | 0.005 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 365 |

MORE ↓

| RESULTS $\alpha$ (unitless) |
|---|
| **7.87E-04** |

END

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100 cm
**FOUNDATION:** Crawl Space
**BUILDING:** Residential

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ (µg/m³) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 156592 | 1.00E+00 | | | cis-1,2-Dichloroethylene |

MORE ↓

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ (°C) | ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ (cm²) |
|---|---|---|---|---|---|---|---|---|
| 0 | 100 | 20 | 100 | 0 | 0 | SIC | | |

MORE ↓

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ (g/cm³) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ (cm³/cm³) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ (g/cm³) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ (cm³/cm³) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ (g/cm³) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ (cm³/cm³) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE ↓

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1.00E-10 | 1500 | 1000 | 250 | 300 | 0.6 | 0.000000375 | 3750 | 1.00E-10 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 350 |

MORE ↓

| RESULTS α (unitless) |
|---|
| 1.04E-03 |

END

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100 cm
**FOUNDATION:** Crawl Space
**BUILDING:** Residential

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ (µg/m³) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 79016 | 1.00E+00 | | | Trichloroethylene |

MORE ↓

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ (°C) | ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ (cm²) |
|---|---|---|---|---|---|---|---|---|
| 0 | 100 | 20 | 100 | 0 | 0 | SIC | | |

MORE ↓

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ (g/cm³) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ (cm³/cm³) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ (g/cm³) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ (cm³/cm³) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ (g/cm³) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ (cm³/cm³) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE ↓

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1.00E-10 | 1500 | 1000 | 250 | 300 | 0.6 | 0.000000375 | 3750 | 1.00E-10 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 350 |

MORE ↓

| RESULTS α (unitless) |
|---|
| **8.06E-04** |

END

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100cm or 200cm
**FOUNDATION:** Basement
**BUILDING:** Residential

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ ($\mu g/m^3$) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 156592 | 1.00E+00 | | | cis-1,2-Dichloroethylene |

MORE

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ ($^oC$) | ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ ($cm^2$) |
|---|---|---|---|---|---|---|---|---|
| 240 | 250 | 20 | 250 | 0 | 0 | SIC | | |

MORE

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ ($g/cm^3$) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ ($cm^3/cm^3$) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ ($g/cm^3$) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ ($cm^3/cm^3$) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ ($g/cm^3$) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ ($cm^3/cm^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, $\Delta P$ ($g/cm\text{-}s^2$) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 40 | 1500 | 1000 | 240 | 0.5 | 0.6 | 18 | 3600 | 0.005 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 365 |

MORE

| RESULTS $\alpha$ (unitless) |
|---|
| **3.98E-03** |

END

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100cm or 200cm
**FOUNDATION:** Basement
**BUILDING:** Residential

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ (µg/m³) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 79016 | 1.00E+00 | | | Trichloroethylene |

MORE ↓

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ (°C) | ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ (cm²) |
|---|---|---|---|---|---|---|---|---|
| 240 | 250 | 20 | 250 | 0 | 0 | SIC | | |

MORE ↓

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ (g/cm³) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ (cm³/cm³) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ (g/cm³) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ (cm³/cm³) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ (g/cm³) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ (cm³/cm³) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE ↓

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 40 | 1500 | 1000 | 240 | 0.5 | 0.6 | 18 | 3600 | 0.005 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 365 |

MORE ↓

| RESULTS α (unitless) |
|---|
| **3.76E-03** |

END

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100cm or 200cm
**FOUNDATION:** Basement
**BUILDING:** Residential

**SENSITIVITY ASSESSMENT - SCENARIO C2**

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ (µg/m³) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 79016 | 1.00E+00 | | | Trichloroethylene |

MORE ↓

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ (°C) | ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ (cm²) |
|---|---|---|---|---|---|---|---|---|
| 200 | 205 | 20 | 200 | 5 | 0 | SIC | | |

MORE ↓

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ (g/cm³) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ (cm³/cm³) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ (g/cm³) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ (cm³/cm³) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ (g/cm³) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ (cm³/cm³) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE ↓

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 40 | 1500 | 1000 | 200 | 0.5 | 0.6 | 15 | 3000 | 0.005 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 365 |

MORE ↓

| RESULTS α (unitless) |
|---|
| **2.80E-04** |

END

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100 cm
**FOUNDATION:** Slab on Grade
**BUILDING:** Commercial

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ (µg/m³) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 156592 | 1.00E+00 | | | cis-1,2-Dichloroethylene |

MORE

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ (°C) | ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ (cm²) |
|---|---|---|---|---|---|---|---|---|
| 15 | 100 | 20 | 100 | 0 | 0 | SIC | | |

MORE

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ (g/cm³) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ (cm³/cm³) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ (g/cm³) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ (cm³/cm³) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ (g/cm³) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ (cm³/cm³) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 15 | 40 | 2000 | 2000 | 300 | 0.5 | 0.83 | 83 | 16600 | 0.005 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 365 |

MORE

| RESULTS α (unitless) |
|---|
| **6.41E-04** |

END

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100 cm
**FOUNDATION:** Slab on Grade
**BUILDING:** Commercial

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ (µg/m³) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 79016 | 1.00E+00 | | | Trichloroethylene |

MORE ↓

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ (°C) | ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ (cm²) |
|---|---|---|---|---|---|---|---|---|
| 15 | 100 | 20 | 100 | 0 | 0 | SIC | | |

MORE ↓

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ (g/cm³) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ (cm³/cm³) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ (g/cm³) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ (cm³/cm³) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ (g/cm³) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ (cm³/cm³) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE ↓

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 15 | 40 | 2000 | 2000 | 300 | 0.5 | 0.83 | 83 | 16600 | 0.005 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 365 |

MORE ↓

| RESULTS α (unitless) |
|---|
| **5.13E-04** |

END

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100 cm
**FOUNDATION:** None
**BUILDING:** Trench Worker

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ (µg/m³) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 156592 | 1.00E+00 | | | cis-1,2-Dichloroethylene |

MORE ↓

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ (°C) | ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ (cm²) |
|---|---|---|---|---|---|---|---|---|
| 100 | 110 | 20 | 110 | 0 | 0 | SIC | | |

MORE ↓

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ (g/cm³) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ (cm³/cm³) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ (g/cm³) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ (cm³/cm³) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ (g/cm³) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ (cm³/cm³) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE ↓

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1.00E-10 | 1000 | 100 | 200 | 146 | 87.5 | 0.002916667 | 29166.66667 | 0.0000001 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 365 |

MORE ↓

| RESULTS α (unitless) |
|---|
| 2.85E-04 |

END

DATA ENTRY SHEET

SG-ADV 2016
Version 3.1; 02/04

Reset to Defaults

**SAMPLE DEPTH:** 100cm
**FOUNDATION:** None
**BUILDING:** Trench Worker

Soil Gas Concentration Data

| ENTER Chemical CAS No. (numbers only, no dashes) | ENTER Soil gas conc., $C_g$ (µg/m³) | OR | ENTER Soil gas conc., $C_g$ (ppmv) | Chemical |
|---|---|---|---|---|
| 79016 | 1.00E+00 | | | Trichloroethylene |

MORE ↓

| ENTER Depth below grade to bottom of enclosed space floor, $L_F$ (cm) | ENTER Soil gas sampling depth below grade, $L_s$ (cm) | ENTER Average soil temperature, $T_S$ (°C) | ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, $h_A$ (cm) | ENTER Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm) | ENTER Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm) | ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability) | OR | ENTER User-defined stratum A soil vapor permeability, $k_v$ (cm²) |
|---|---|---|---|---|---|---|---|---|
| 100 | 110 | 20 | 110 | 0 | 0 | SIC | | |

MORE ↓

| ENTER Stratum A SCS soil type (Lookup Soil Parameters) | ENTER Stratum A soil dry bulk density, $\rho_b^A$ (g/cm³) | ENTER Stratum A soil total porosity, $n^A$ (unitless) | ENTER Stratum A soil water-filled porosity, $\theta_w^A$ (cm³/cm³) | ENTER Stratum B SCS soil type (Lookup Soil Parameters) | ENTER Stratum B soil dry bulk density, $\rho_b^B$ (g/cm³) | ENTER Stratum B soil total porosity, $n^B$ (unitless) | ENTER Stratum B soil water-filled porosity, $\theta_w^B$ (cm³/cm³) | ENTER Stratum C SCS soil type (Lookup Soil Parameters) | ENTER Stratum C soil dry bulk density, $\rho_b^C$ (g/cm³) | ENTER Stratum C soil total porosity, $n^C$ (unitless) | ENTER Stratum C soil water-filled porosity, $\theta_w^C$ (cm³/cm³) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SIC | 1.5 | 0.48 | 0.22 | SC | 1.6 | 0.36 | 0.31 | S | 1.44 | 0.47 | 0.179 |

MORE ↓

| ENTER Enclosed space floor thickness, $L_{crack}$ (cm) | ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²) | ENTER Enclosed space floor length, $L_B$ (cm) | ENTER Enclosed space floor width, $W_B$ (cm) | ENTER Enclosed space height, $H_B$ (cm) | ENTER Floor-wall seam crack width, w (cm) | ENTER Indoor air exchange rate, ER (1/h) | ENTER Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m) | $Q_{building}$ (L/m) | $Q_{soil}/Q_{building}$ (unitless) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1.00E-10 | 1000 | 100 | 200 | 146 | 87.5 | 0.002916667 | 29166.66667 | 0.0000001 |

| ENTER Averaging time for carcinogens, $AT_C$ (yrs) | ENTER Averaging time for noncarcinogens, $AT_{NC}$ (yrs) | ENTER Exposure duration, ED (yrs) | ENTER Exposure frequency, EF (days/yr) |
|---|---|---|---|
| 70 | 35 | 35 | 365 |

MORE ↓

| RESULTS α (unitless) |
|---|
| 2.21E-04 |

END

# Schedule B7

## APPENDIX A6

## The Derivation of Interim HILs for Volatile Organic Chlorinated Compounds

# 1 Trichloroethene (TCE)

## 1.1 General

Several comprehensive reviews of trichloroethene (TCE) in the environment and its toxicity to humans are available and should be consulted for more detailed information not presented in this summary (ATSDR 1997; WHO 1985; EU 2004; CCME 2007; NICNAS 2009; US EPA 2011). The following provides a summary of the key aspects of TCE that are relevant to the derivation of interim HILs.

TCE is a colourless, non-flammable, volatile liquid, with a characteristic slightly sweet odour. Most people can begin to smell TCE in air at a concentration of 100 ppm (ATSDR 1997).

TCE was not thought to occur naturally in the environment until the recent discovery in 1995 that several species of marine macro-algae and at least one species of micro-algae produce the compound. The importance of this release and potential exposure route is not currently known. TCE is mainly used as an industrial solvent in a variety of industries, primarily metal degreasing and cleaning operations. TCE can also be found in some household products, including correction fluid, paint removers, adhesives, and spot removers. TCE has also been used as a carrier solvent for the active ingredients of insecticides and fungicides; as a solvent for waxes, fats, resins, and oils; and as an anaesthetic for medical and dental use. It has also been used to extract spice oleoresins and caffeine from coffee (ATSDR 1997; WHO 1985).

TCE was manufactured in Australia for approximately 30 years from the early 1950s to the early 1980s. At present, the Australian market demand for TCE is entirely met by imports of the chemical. TCE is used widely in both large and small industries, mainly as a degreasing agent (NICNAS 2009).

If released into the environment, the following can be noted with respect to TCE (WHO 1985):

- Air – TCE is expected to remain in the vapour phase. Removal is primarily through reaction with hydroxyl radicals to produce low levels of phosgene, dichloroacetyl chloride, formyl chloride and other degradation products. The half-life of TCE varies from 1 day to months.
- Soil and Water – TCE is expected to volatilise from surface soils and water. TCE may leach through soil into groundwater where it may persist for years, depending on conditions.
- Water – Depending on conditions, reductive dehalogenation to vinyl chloride may occur. Under anaerobic conditions TCE can be intrinsically biodegraded to form dichloroethene (1,1-DCE and isomers of 1,2-DCE) and vinyl chloride.

## 1.2 Previous HIL

No previous HIL is available for TCE (NEPC 1999).

## 1.3 Proposed Interim HIL

Review of available information in relation to the presence of TCE in soil indicates that the vapour inhalation pathway is the most significant/important. This pathway should be assessed on the basis of measured vapour data, in particular, soil vapour data. There are significant limitations in the derivation of a soil HIL, in particular, the modelling of phase partitioning from soil to soil vapour and the field measurement of volatiles in soil, hence an interim HIL has been derived for soil vapour only.

The following presents the values adopted for the calculation of a soil vapour interim HIL. In addition, other information that is relevant to the assessment of TCE in soil (relevant to other pathways of exposure) is presented.

## 1.4 Significance of Exposure Pathways

### 1.4.1 Inhalation

TCE is a volatile compound and, as such, the derivation of the HIL has considered the vapour inhalation pathway as the most significant. The approach adopted for the quantification of potential vapour migration to outdoor air and intrusion indoors is outlined in the main text of Schedule B7. Due to limitations with the vapour modelling approach adopted, the HILs derived are considered interim.

The inhalation of particulates outdoors and indoors is considered essentially insignificant, compared with vapour inhalation.

### 1.4.2 Dermal absorption

Insufficient data is available on the dermal absorption of TCE from soil. Given the volatility of the compound, dermal absorption is expected to be low, however, as there is insufficient data available to further assess dermal absorption from soil, a default value of 0.03 (3%) has been adopted for the volatile organic compounds (US EPA 1995).

### 1.4.3 Plant Uptake

Limited data is available on the potential for TCE to be taken up by home-grown produce. According to ATSDR (1997), TCE has been detected in small amounts in fruits and vegetables, suggesting a potential for limited phytoaccumulation. Laboratory studies with carrot and radish plants and radioactively labelled TCE (Schroll et al. 1994) showed some uptake, though it is noted that the experiment indicated that uptake occurred mainly through the foliage (from the air) as opposed to the roots in these plants (with subsequent translocation throughout the plant tissues). Schnabel et al. (1997) looked at the uptake of TCE in edible garden plants (carrots, spinach and tomatoes) and identified that TCE, when taken up, was transformed and bound to plant tissues in a form that was less toxic than the parent compound.

On the basis of the above, the use of the more commonly adopted equations for quantifying plant uptake (as presented in the text of Schedule B7) that do not address uptake of volatiles (from air) rather than the root, or transformations within the plant, are not considered appropriate and relevant for the assessment of TCE.

It is expected that the potential for plant uptake will be of less significance in the derivation of a soil HIL, when compared with the assessment of vapour inhalation, and given the limitations involved in providing a meaningful evaluation of plant uptake, it has not been considered in the derivation of HILs.

### 1.4.4 Intakes from Other Sources – Background

As TCE is highly volatile, background intakes will be dominated by inhalation exposures. Concentrations of TCE in industrial, urban and regional areas are available in Australia. Data collected in NSW (DEC 2003) from urban and regional areas in NSW report average concentrations of TCE of approximately 0.1 ppbv (0.0005 mg/$m^3$), close to the analytical limit of reporting with most samples noted to be not detected, with a maximum concentration in the Sydney CBD of 3.6 ppbv (0.019 mg/m3). Concentrations in an industrial area in Brisbane (Hawas et. al. 2001) have been reported with average and maximum concentrations of 0.0002 mg/m3 (also close to the limit of reporting) and 0.0005 mg/m3 respectively. Background air concentrations in Canada (CCME 2007) are considered to be approximately 0.0014 mg/m3, consistent with the range reported by DEC (2003). Background intakes (dominated by inhalation) were estimated by WHO (2011) to be approximately 0.04 µg/kg/day for children and 0.01 µg/kg/day for adults. Based on average concentrations reported in NSW and in Brisbane, intakes by young children are estimated to be approximately 0.3 µg/kg/day. These intakes comprise approximately 10% of the recommended inhalation TRVs for non-carcinogenic effects. It is noted that other sources found indoors (from a wide range of common products) are likely to be

present and may contribute more significantly to background exposures. These sources may need to be addressed on a site-specific basis.

## 1.5 Identification of Toxicity Reference Values

### 1.5.1 Classification

The International Agency for Research on Cancer (IARC 1995) has classified TCE as Group 2A—probably carcinogenic to humans.

Review by US EPA (2011) characterised TCE as carcinogenic in humans by all routes of exposure. This conclusion is based on convincing evidence of a causal association between TCE exposure in humans and kidney cancer. The human evidence of carcinogenicity from epidemiologic studies of TCE exposure is strong for non-Hodgkin Lymphoma but less convincing than for kidney cancer, and more limited for liver and biliary tract cancer. Less human evidence is found for an association between TCE exposure and other types of cancer, including bladder, oesophageal, prostate, cervical, breast, and childhood leukaemia. Further support is derived from positive results in multiple rodent bioassays, similar toxicokinetics between rodents and humans, mechanistic data supporting a mutagenic mode of action for kidney tumours.

### 1.5.2 Review of Available Values/Information

Some epidemiological studies indicate a possible association between exposure to TCE and an increased cancer risk, with IARC (1995) noting elevated risk for cancer of the liver and biliary tract and a modestly elevated risk for non-Hodgkin's lymphoma in three cohort studies. In animals, TCE induces tumours at several sites and in different species. Tumours have been seen in mouse liver and lung and rat kidney and testis. On the basis of the available information, most current reviews by IARC (1995), WHO (2011), CCME (2007) and US EPA (2011) consider TCE to be carcinogenic (with responses tending to increase with dose), via all routes of exposure.

The potential mode of action (MoA) for TCE is reviewed and discussed in the current WHO DWG (2011) and US EPA (2011) review.

The WHO DWG (2011) review concluded that the MoA for tumour induction by TCE may be attributed to non-genotoxic processes (related to cytotoxicity, peroxisome proliferation and altered cell signalling); genotoxic processes, (such as the production of genotoxic metabolites (e.g., chloral and DCVC[1])); or the production of reactive oxygen species related to peroxisomal induction in the liver. The potential role of several mutagenic or carcinogenic metabolites of TCE cannot be ignored. Hence TCE appears to be at least weakly genotoxic and evaluation of carcinogenicity on the basis of a non-threshold approach is considered appropriate (as is undertaken in the current WHO DWG (2011) and WHO Air Quality Guidelines (2000)).

The most recent US EPA review (2011) provides a detailed assessment of genotoxicity (of TCE and metabolites) and mutagenicity. With respect to genotoxicity, although it appears unlikely that TCE, as a pure compound, causes point mutations, there is evidence for TCE genotoxicity with respect to other genetic end points, such as micronucleus formation. In addition, several TCE metabolites have tested positive in genotoxicity assays. It is noted that uncertainties with regard to the characterisation of TCE genotoxicity remain, particularly because not all TCE metabolites have been sufficiently tested in the standard genotoxicity screening battery to derive a comprehensive conclusion. However, the metabolites that have been tested, particularly DCVC, have predominantly resulted in positive data, supporting the conclusion that these compounds are genotoxic.

[1] DCVC is the abbreviation for the metabolite S-(1,2-dichlorovinyl)-L-cysteine.

The MoA relevant to specific target organs in laboratory animals has been reviewed by US EPA. Only in the case of the kidney is it concluded that the data is sufficient to support a particular MoA being operative. For the kidney, the predominance of positive genotoxicity data in the database of available studies of TCE metabolites, together with toxicokinetic data, supports the conclusion that a mutagenic MoA is operative in TCE-induced kidney tumours. Hence a linear (non-threshold) approach is recommended for the quantification of carcinogenic effects.

There is some evidence that certain populations may be more susceptible to exposure to TCE. Because the weight of evidence supports a mutagenic MoA being operative for TCE carcinogenicity in the kidney, and there is an absence of chemical-specific data to evaluate differences in carcinogenic susceptibility, early-life susceptibility is recommended by US EPA to be assumed and the age-dependent adjustment factors (ADAFs) should be applied.

On the basis of the above, it is reasonable to consider a non-threshold approach for the assessment of carcinogenicity in relation to TCE. It is noted that a number of guidelines (such as WHO 2011) have been derived on the basis of both carcinogenic and non-carcinogenic end points, with non-carcinogenic end points noted to be more sensitive for at least oral intakes. Hence both non-threshold and threshold reference values available have been noted in the following.

The following quantitative values are available for TCE from Level 1 Australian and International sources:

| Source | Value | Basis/Comments |
|---|---|---|
| **Australian** | | |
| ADWG (NHMRC 2011) | No health-based value derived | Not derived due to insufficient data. |
| **International** | | |
| WHO (2011) | SF = 0.00078 $(mg/kg/day)^{-1}$<br>TDI = 0.00146 mg/kg/day | The WHO guideline of 0.02 mg/L is based on the lower value derived from carcinogenic and non-carcinogenic end points. It is noted that the guideline derived on the basis of reproductive/developmental (threshold) effects was most conservative.<br>The oral slope factor adopted is from Health Canada (range of values derived) and based on combined tubular cell adenomas and adenocarcinomas of the kidneys in rats following oral exposure to TCE for 103 weeks and a linear multistage model.<br>The oral TDI derived from a $BMDL_{10}$ of 0.146 mg/kg/day associated with reproductive/developmental effects in rats, and an uncertainty factor of 100. |
| WHO (2000 and 2010) | UR = $4.3x10^{-7}$ $(\mu g/m^3)^{-1}$ | Inhalation unit risk derived on the basis of Leydig-cell tumours in the testes of rats and a linear multistage model. Inhalation unit risk from rat study is supported by a similar unit risk of 9 $x10^{-7}$ $(\mu g/m^3)^{-1}$ derived from increased incidence of hepatic tumours in a cohort study of occupationally exposed adults. The non-threshold approach was adopted by the WHO as TCE was considered genotoxic and carcinogenic. |
| EU (2004) | SF = 0.0019 $(mg/kg/day)^{-1}$ | TCE gives rise to concern for humans owing to possible mutagenic and carcinogenic effects and because it is not possible to identify a threshold exposure level below which these effects would not be expressed. For non-carcinogenic effects, the most sensitive threshold effect evaluated was associated with CNS disturbance following repeated dose where a NOAEL of 38 |

| Source | Value | Basis/Comments |
|---|---|---|
| | | mg/kg/day was considered.<br>The EU has presented a calculation of lifetime cancer risk based on the T25 method in relation to non-Hodgkin lymphoma. From an inhalation study in female mice a HT25 dose descriptor for humans was derived as 130 mg/kg/day. Following the approach presented, the EU calculated increased cancer risk for TCE for all groups using an equivalent slope factor of 0.0019 $(mg/kg/day)^{-1}$. This value was used in the quantification of risk associated with exposure from oral, dermal and inhalation pathways for workers, consumers and environmental exposures. |
| Health Canada (2005) | SF = 0.000811 $(mg/kg/day)^{-1}$<br>UR = $1.2x10^{-7}$ $(\mu g/m^3)^{-1}$<br>TDI = 0.00146 mg/kg/day | Oral slope factor derived on the basis of the same study noted in WHO (2011), however a slightly different value is quoted.<br>Inhalation unit risk based on renal adenocarcinomas in rats following inhalation exposures for 104 weeks in males (a lower, less conservative value was derived for females).<br>Note that the derivation of drinking water guidelines has also considered the oral TDI noted in the WHO DWG which results in a lower guideline than is derived on the basis of the oral slope factor. |
| CCME (2007) | SF = 0.000811 $(mg/kg/day)^{-1}$<br>UR = $6.4x10^{-7}$ $(\mu g/m^3)^{-1}$<br>TDI = 0.00146 mg/kg/day<br>TC = 0.04 $mg/m^3$ | Slope factor based on same study noted by Health Canada (2005).<br>Inhalation unit risk based on older evaluation from Health Canada where a $TC_{05}$ (concentration expected to cause a 5% incidence in cancer) of 0.082 $mg/m^3$ and extrapolation based on an excess lifetime cancer risk of $10^{-6}$.<br>TDI and TC values also presented for non-carcinogenic end points.<br>TDI as noted by WHO DWG<br>TC adopted from the former US EPA RfC (currently withdrawn pending finalisation of the 2009 draft) associated with effects on the CNS, kidney, liver and endocrine system in inhalation studies where a point of departure (POD) of 38 $mg/m^3$ was identified, and an uncertainty factor of 1000 adopted. |
| RIVM (2001) | PTDI = 0.05 mg/kg/day<br>PTC = 0.2 $mg/m^3$ | Provision threshold values derived for TCE due to limited data and an assumption that the genotoxic mechanism for TCE (numerical chromosome aberration *in vivo*) exhibits a threshold. The basis for these values is not listed here as the evaluation is considered dated. |
| ATSDR (1997) | No chronic MRLs derived | No chronic oral or inhalation MRL has been established. |
| New York State (NYS DH 2006) | GV = 0.005 $mg/m^3$ | An air guideline value (GV) of 0.01 $mg/m^3$ was derived for non-carcinogenic effects (CNS effects in humans) is based on review of all available studies and associated end points. The lowest guideline value has been adopted and is noted to be protective of the general population including sensitive life stages of infants, children, the infirm and elderly. The GV resulted in carcinogenic risk estimates at the lower end of the risk range ($1x10^{-6}$ to $1x10^{-4}$). The guideline value was then reduced by a factor of 2 based on the consideration of additional factors (data gaps, concern regarding methods for |

| Source | Value | Basis/Comments |
|---|---|---|
| | | evaluating risks to children and concerns regarding human carcinogenicity) in addition to background levels and analytical capabilities. The resulting air guideline derived was 0.005 $mg/m^3$. |
| US EPA (2011) | SF = 0.05 $(mg/kg/day)^{-1}$<br>UR = $4x10^{-6}$ $(\mu g/m^3)^{-1}$<br>RfD = 0.0005 mg/kg/day<br>RfC = 0.002 $mg/m^3$ | Oral slope factor based on PBPK model-based route-to-route extrapolation from the inhalation value based on human kidney cancer risks. The value is also supported by data from oral bioassays.<br>Inhalation unit risk derived on the basis of non-Hodgkin's lymphoma , renal cell carcinoma and liver tumours from a human inhalation (epidemiology) studies, adjusted (by a factor of 4) to address potential risk of tumours at multiple sites. The value is derived from linear extrapolation from the point of departure (LEC01). It is noted that even with the consideration of the 4-fold factor, the inhalation unit risk value derived is within the range of values derived from a wide range of studies.<br>Application of the ADAF for kidney cancer risks due to evidence supporting a mutagenic MoA is recommended.<br>RfD based on critical effects of heart malformations (rats), adult immunological effects (mice) and developmental immunotoxicity (mice), which is further supported by an oral study for the toxic nephropathy (rats) and route extrapolation from an inhalation study.<br>RfC based on route-extrapolation from and oral studies for the critical effects of heart malformations in rats and immunotoxicity in mice, and incorporation of uncertainty factors ranging from 10 to 100. |

For TCE the health end points associated with carcinogenic (non-threshold) and non-carcinogenic (threshold) effects are similar in sensitivity. Hence it is appropriate that the derivation of a guideline consider all relevant end points to ensure that the value derived is adequately protective of all effects.

Many of the reviews conducted by WHO (2011), CCME (2007), RIVM (2001) and ATSDR (1997) have considered limited and dated databases of information (as noted). The most recent comprehensive review of TCE toxicity has been conducted by US EPA (2011), where the most recent studies and health end points have been addressed. The more recent review by WHO (2010), in relation to inhalation toxicity, considered some of the more recent studies, though the review has not considered non-carcinogenic end points, and the key studies considered by US EPA (2011) for the derivation of the inhalation unit risk were not considered in the WHO (2010) review. On this basis it is considered appropriate that the more recent evaluation conducted by US EPA (2011) be used for the purpose of establishing soil vapour Interim HILs.

The US EPA review has concluded that there is sufficient weight of evidence that TCE operates through a mutagenic mode of action (MoA) for kidney tumours and there is a lack of TCE-specific quantitative data in relation to early lifetime susceptibility. Hence it is appropriate to consider increased susceptibility associated with early lifetime exposures through the adjustment of exposure factors. This adjustment, however is noted to be relevant to the kidney cancer component of the total risk (note the inhalation unit risk includes a factor of 4-fold to address the risk of tumours at multiple sites). The effect of considering theses age-adjusted exposure factors to only the kidney cancer portion of the unit risk has been evaluated by US EPA and determined to be of minimal impacts to the total cancer risk, except when exposure only occurs during early life (if these effects occur). In addition to this evaluation, a number of uncertainties have been identified in relation to applying the age

adjustment factors for a more complex carcinogenic MoA, as identified for TCE. Hence, for the purpose of deriving HILs where long-term exposures are considered, no further adjustments to account for potential early lifetime susceptibility have been incorporated.

### 1.5.3 Recommendation

In relation to TCE, only soil vapour Interim HILs have been derived. Hence only the inhalation pathway has been quantified in the development of these HILs. On the basis of the discussion above, the following inhalation toxicity reference values (TRVs) have been adopted for TCE:

**Recommendation for TCE (quantitative inhalation toxicity values)**

Carcinogenic end points evaluated on the basis of:

Inhalation TRV ($TRV_I$) = 0.004 $(mg/m^3)^{-1}$ (US EPA 2011)

Non-Carcinogenic end points evaluated on the basis of:

Inhalation TRV ($TRV_I$) = 0.002 $mg/m^3$ (US EPA 2011)

Background intakes from other sources (as % of TRV):

BIi = 10% for inhalation

## 1.6 Calculated Interim HILs

Based on the evaluation presented above, a range of approaches has been identified for the quantification of exposure and toxicity. The following comments relate to the derivation of the interim soil vapour HIL A (also note the methodology and assumptions adopted, as outlined in the text of Schedule B7):

- The calculated interim soil vapour HIL for TCE on the basis of the adopted threshold TRVs noted above is 0.02 $mg/m^3$.
- The calculated interim soil vapour HIL for TCE on the basis of the adopted non-threshold TRVs noted above is 0.06 $mg/m^3$.

The most sensitive end point for the derivation of the interim soil vapour HIL is the assessment of threshold (non-carcinogenic) effects.

On the basis of the above, the following interim soil vapour HILs have been derived for TCE (refer to Appendix B for equations used to calculate the HILs and Appendix C for calculations):

| HIL Scenario | Interim Soil Vapour HIL# ($mg/m^3$) |
|---|---|
| Residential A | 0.02 |
| Residential B | 0.02 |
| Recreational C | 0.4 |
| Commercial D | 0.08 |

# Interim soil gas HILs are conservative soil gas concentrations that can be adopted for the purpose of screening sites where further investigation is required on a site-specific basis. They are based on the potential for vapour intrusion indoors using an indoor air-to-soil gas attenuation factor of 0.1 for HILs A, B and D and an outdoor attenuation factor of 0.05 for HIL C.

## 1.7 References


ATSDR 1997, *Toxicological Profile for Trichloroethylene*, available on website and current.

CCME 2007, *Canadian Soil Quality Guidelines, Trichloroethylene, Environmental and Human health Effects, Scientific Supporting Document,* Canadian Council of Ministers of the Environment.

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US EPA (IRIS 2012), data and information available from the *Integrated Risk Information System*, an online database, available from http://www.epa.gov/iris/.

US EPA 1995, *Technical Guidance Manual, Assessing Dermal Exposure from Soil*, US EPA Region 3, December 1995, available from: http://www.epa.gov/reg3hwmd/risk/human/info/solabsg2.htm.

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WHO 1985, *Environmental Health Criteria No 50 Trichloroethylene,* World Health Organization, Geneva.

WHO 2000, *Air Quality Guidelines for Europe, 2nd edn*, World Health Organization, Geneva.

WHO 2010, *WHO Guidelines for Indoor Air Quality, Selected Pollutants*, WHO Regional Office for Europe.

WHO 2011, *Guidelines for drinking-water quality, 4th edn*, World Health Organization, Geneva, available from http://www.who.int/water_sanitation_health/dwq/chemicals/en/index.html.

# 4 Cis-1,2-Dichloroethene (DCE)

## 4.1 General

Several comprehensive reviews of *cis*-1,2-dichloroethene (DCE) in the environment and its toxicity to humans are available and should be consulted for more detailed information (ATSDR 1996; WHO 2011). The following provides a summary of the key aspects of DCE that is relevant to the derivation of interim HILs.

DCE is a colourless, volatile and flammable liquid with a characteristic sharp, harsh odour. It is one of two isomers of 1,2-DCE, the second being *trans*-1,2-DCE. *cis*-1,2-DCE is considered to be more toxic than *trans*-1,2-DCE and hence the HILs derived for the *cis*-isomer are adequately protective of exposures associated with the *trans*-isomer.

DCE is not known to occur naturally. It is most commonly used as a chemical intermediate to produce chlorinated solvents and chemical compounds. It is also used in rubber extraction, pharmaceutical manufacturing, as a refrigerant and in the extraction of oils from meats and fish. DCE has also historically been used as a solvent for a variety of waxes, resins, perfumes, dyes, lacquers, acetyl cellulose, thermoplastics and phenols (ATSDR 1996).

## 4.2 Previous HIL

No previous HIL is available for DCE (NEPC 1999).

## 4.3 Proposed Interim HIL

Review of available information in relation to the presence of DCE in soil indicates that the vapour inhalation pathway is the most significant/important. This pathway should be assessed on the basis of measured vapour data, in particular, soil vapour data. There are significant limitations in the derivation of a soil HIL, in particular, the modelling of phase partitioning from soil to soil vapour and the field measurement of volatiles in soil. Hence, an interim HIL has been derived for soil vapour only.

The following presents the values adopted for the calculation of a soil vapour interim HIL. In addition, other information that is relevant to the assessment of DCE in soil (relevant to other pathways of exposure) is presented.

## 4.4 Significance of Exposure Pathways

### 4.4.1 Inhalation

DCE is a volatile compound and, as such, the derivation of the HIL has considered the vapour inhalation pathway. The approach adopted for the quantification of potential vapour migration to outdoor air and intrusion indoors is outlined in Schedule B7. It is noted that the derived HIL is dominated by the assessment of these pathways of exposure. Due to limitations with the vapour modelling approach, adopted the HILs derived are considered interim.

The inhalation of particulates outdoors and indoors is considered essentially insignificant, compared with vapour inhalation.

### 4.4.2 Dermal absorption

Insufficient data is available on the dermal absorption of DCE from soil. Given the volatility of the compound, dermal absorption is expected to be low though, as there is insufficient data available to further assess dermal absorption from soil, a default value of 0.03 (3%) has been adopted for the volatile organic compounds (US EPA 1995).

### 4.4.3 Plant Uptake

No data is available on the potential for DCE to be taken up by home-grown produce. Given the volatility of this compound, the potential for plant uptake is expected to be limited. As with the assessment presented for TCE, the use of the more commonly adopted equations for quantifying plant uptake (as presented in the text of Schedule B7) that do not address uptake of volatiles (from air) rather than the root, or transformations within the plant, are not considered appropriate and relevant for the assessment of DCE.

It is expected that the potential for plant uptake will be of less significance in the derivation of an HIL, when compared with the assessment of vapour inhalation, and given the limitations involved in providing a meaningful evaluation of plant uptake, it has not been considered in the derivation of HILs.

### 4.4.4 Intakes from Other Sources – Background

As DCE is highly volatile and not persistent, background intakes will be dominated by inhalation exposures. DCE is not considered to be a typical urban air contaminant and little data is available for Australian cities. *Cis*-1,2-DCE has been detected in VOC sampling from Perth (WA DEP 2000), with average concentrations of 0.2 ppb (0.8 µg/m$^3$) and a maximum reported concentration of 2.1 ppb (8.3 µg/m$^3$). These values were comparable to average concentrations reported in air in the USA and used by RIVM (2001) to estimate background intake of 1,2-DCE (both isomers) of approximately 0.13 µg/kg/day. Based on the recommended TRV for DCE, this intake is less than 5% and considered negligible (0%).

It is noted that other sources found indoors (from a wide range of common products) are likely to be present and may contribute more significantly to background exposures. These sources need to be addressed on a site-specific basis.

## 4.5 Identification of Toxicity Reference Values

### 4.5.1 Classification

The International Agency for Research on Cancer (IARC) has not classified DCE.

US EPA (2010) has classified 1,2-DCE as 'inadequate information to assess the carcinogenic potential'.

### 4.5.2 Review of Available Values/Information

There is no adequate data available to assess the carcinogenicity of DCE. Review of available genotoxicity studies by WHO (2011) provided equivocal results. Review by RIVM (2001) suggested that cis-1,2-DCE could be considered genotoxic in vivo, producing gene mutations and chromosome aberrations. However, no carcinogenic toxicity values have been derived for the *cis*- isomer. A more recent review of genotoxicity provided by US EPA (2010) suggested that, overall, data for 1,2-DCE (both isomers) is not positive for genotoxicity and mutagenicity. The positive results (considered by RIVM) are considered inconsistent by US EPA and need further confirmation. On the basis of the available information, it is considered appropriate that a threshold dose–response approach be adopted for DCE. Few quantitative toxicity values are available; however, the following are available from Level 1 Australian and International sources:

| Source | Value | Basis/Comments |
|---|---|---|
| **Australian** | | |
| ADWG (NHMRC 2011) | TDI = 0.017 mg/kg/day for *trans*-isomer | The Australian Drinking Water Guidelines (NHMRC 2011) have derived a drinking water guideline of 0.06 mg/L for 1,2-DCE (both isomers) following guidance from WHO (refer below). |
| **International** | | |
| WHO | TDI = 0.017 | WHO (2011) has derived a guideline of 0.05 mg/L |

| Source | Value | Basis/Comments |
|---|---|---|
| (2011) | mg/kg/day for *trans*-isomer | based on a TDI of 0.017 mg/kg/day associated with a NOAEL of 17 mg/kg from a 90-day study in mice administered *trans*-1,2-DCE in drinking water, and an uncertainty factor of 1000. This guideline is relevant to the sum of both *cis*- and *trans*- isomers, however this is due to WHO adopting a conservative approach where there is no data available for the derivation of a *cis*- isomer value. |
| RIVM (2001) | TDI = 0.006 mg/kg/day<br>TC = 0.03 mg/m$^3$ | A TDI of 0.006 mg/kg/day has been established for *cis*-1,2-DCE based on a NOAEL of 32 mg/kg/day from a 90-day oral rat study (using the *cis*- isomer), and an uncertainty factor of 5000.<br>Inhalation tolerable concentrations (TC) were derived for *cis*-1,2-DCE using route extrapolation from the oral study, resulting in a TC of 0.03 mg/m$^3$ |
| ATSDR (1996) | No chronic MRLs derived | |
| US EPA (2010) | RfD = 0.002 mg/kg/day for *cis*-isomer | RfD derived on the basis of a $BMDL_{10}$ of 5.1 mg/kg/day associated with increased kidney weight in male rats and a 3000-fold uncertainty factor (includes 3-fold factor for database deficiencies). No inhalation RfC was derived for the cis-isomer.<br>For the trans-isomer an oral RfD of 0.02 mg/kg/day was derived and no inhalation RfC was derived. |

For the assessment of inhalation exposures (relevant to the derivation of soil vapour Interim HILs), there are no specific TRVs derived from inhalation studies associated with cis-1,2-DCE. An inhalation value can be derived from route extrapolation from an oral value (as undertaken by RIVM). In relation to the available oral TRVs, the most recent evaluation conducted by US EPA is considered the most appropriate. From this oral TRV, an inhalation TRV of 0.007 mg/m$^3$ can be derived (for a 70 kg adult where 20 m$^3$ of air is inhaled each day).

### 4.5.3 Recommendation

In relation to cis-1,2-DCE, only soil vapour Interim HILs have been derived. Hence only the inhalation pathway has been quantified in the development of these HILs. On the basis of the discussion above, the following inhalation toxicity reference values (TRVs) have been adopted for cis-1,2-DCE:

**Recommendation for cis-1,2-DCE**

Inhalation TRV ($TRV_I$) = 0.007 mg/m$^3$ (US EPA 2010)

Background intakes from other sources (as % of TRV):

BIi = 0% for inhalation

## 4.6 Calculated Interim HILs

On the basis of the above, the following interim soil vapour HILs have been derived for DCE (refer to Appendix B for equations used to calculate the HILs and Appendix C for calculations):

| HIL Scenario | Interim Soil Vapour HIL# (mg/m$^3$) |
|---|---|

| | |
|---|---|
| Residential A | 0.08 |
| Residential B | 0.08 |
| Recreational C | 2 |
| Commercial D | 0.3 |

# Interim soil gas HILs are conservative soil gas concentrations that can be adopted for the purpose of screening sites where further investigation is required on a site-specific basis. They are based on the potential for vapour intrusion indoors using an indoor air-to-soil gas attenuation factor of 0.1 for HILs A, B and D and an outdoor attenuation factor of 0.05 for HIL C.

## 4.7 References


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NEPC 1999, *Schedule B (7a), Guideline on Health-Based Investigation Levels, National Environment Protection (Assessment of Site Contamination) Measure,* National Environment Protection Council, Australia.

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WHO 2011, *Guidelines for drinking-water quality, 4th edn*, World Health Organization, Geneva, available from http://www.who.int/water_sanitation_health/dwq/chemicals/en/index.html.

**APPENDIX M**

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