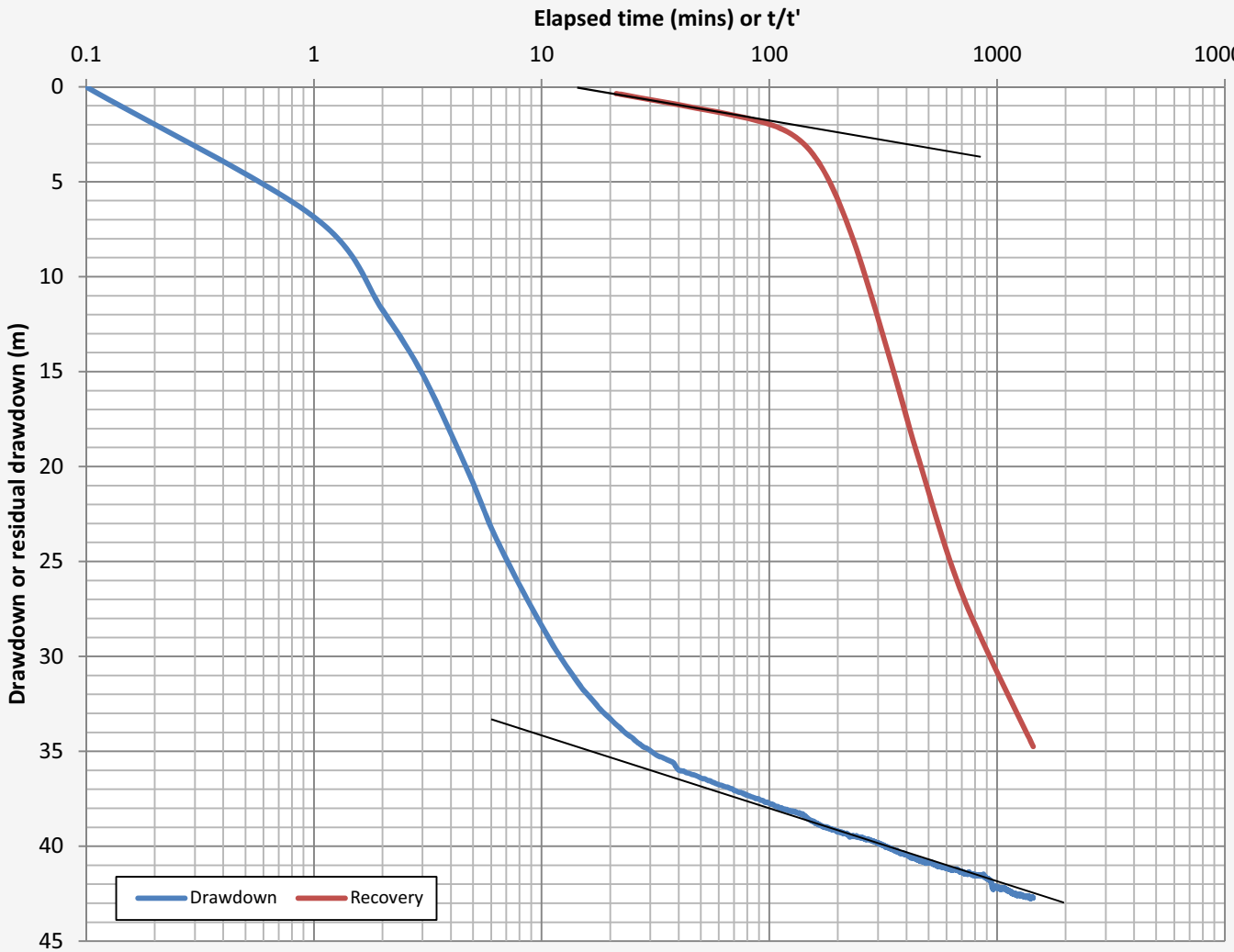
Appendix B

Pumping tests and slug tests



Jacob Straight Line Method and Theis recovery

Discharge
= 4.4 L/s
= 380.2 m^3 /day

Transmissivity
T = 2.3Q/4ΠΔs
= 2.3*380.2/4*Π*4.5
= 15.5 m^2 /day (drawdown)

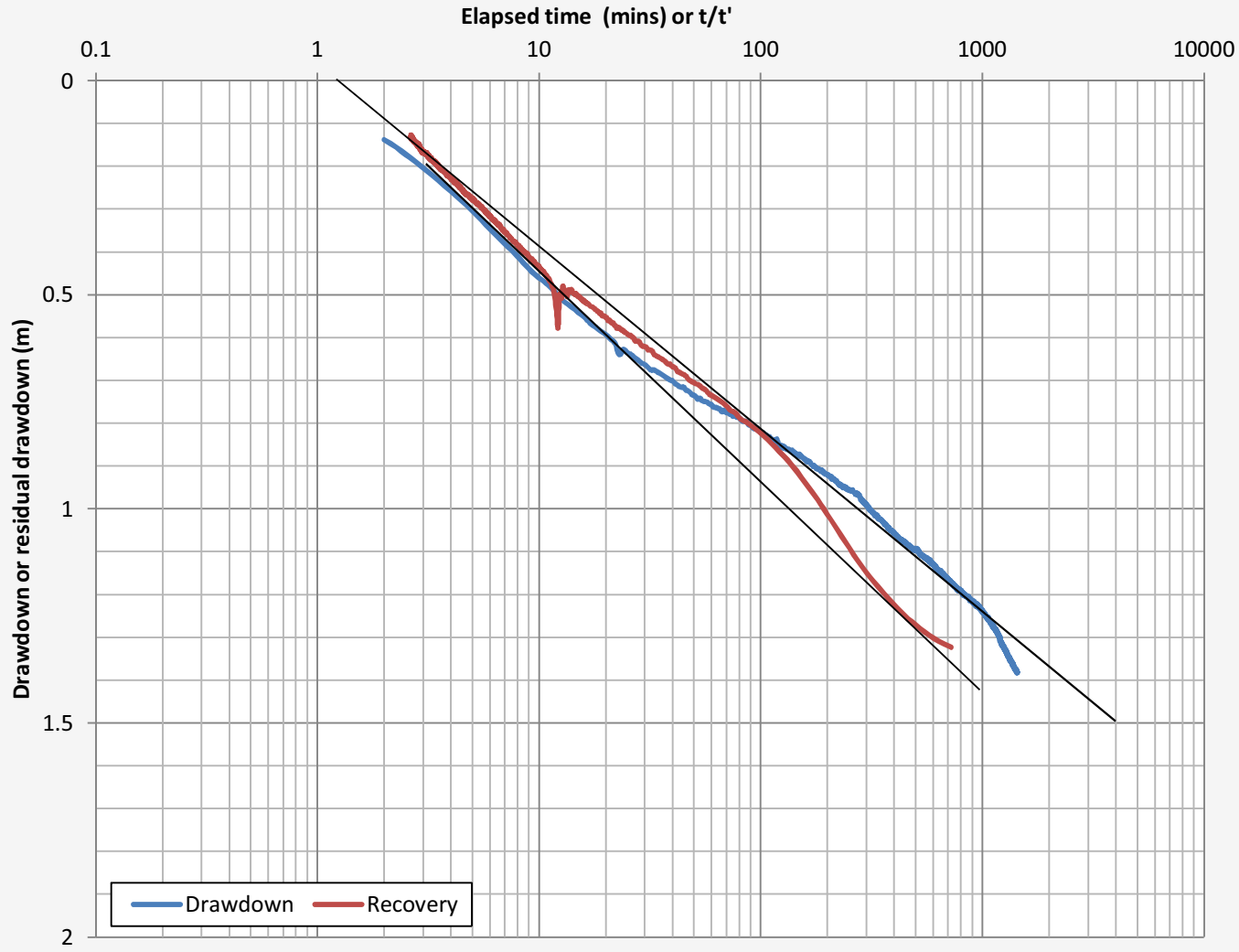
= 2.3*380.2/4*3.14*2.5
= 27.8 m^2 /day (recovery)

Hydraulic conductivity
k = T/b
= 15.5/12.5
= 1.2 m/day (drawdown)

= 27.8/12.5
= 2.2 m/day (recovery)

(Artesian test production bore)

Figure B.1: GW3_TPB 24 hour test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=4.4 L/s
=380.2 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*0.45)
=154.6 m^2/day (drawdown)

=2.3*380.2/(4*∏*0.53)
=131.4 m^2/day (recovery)

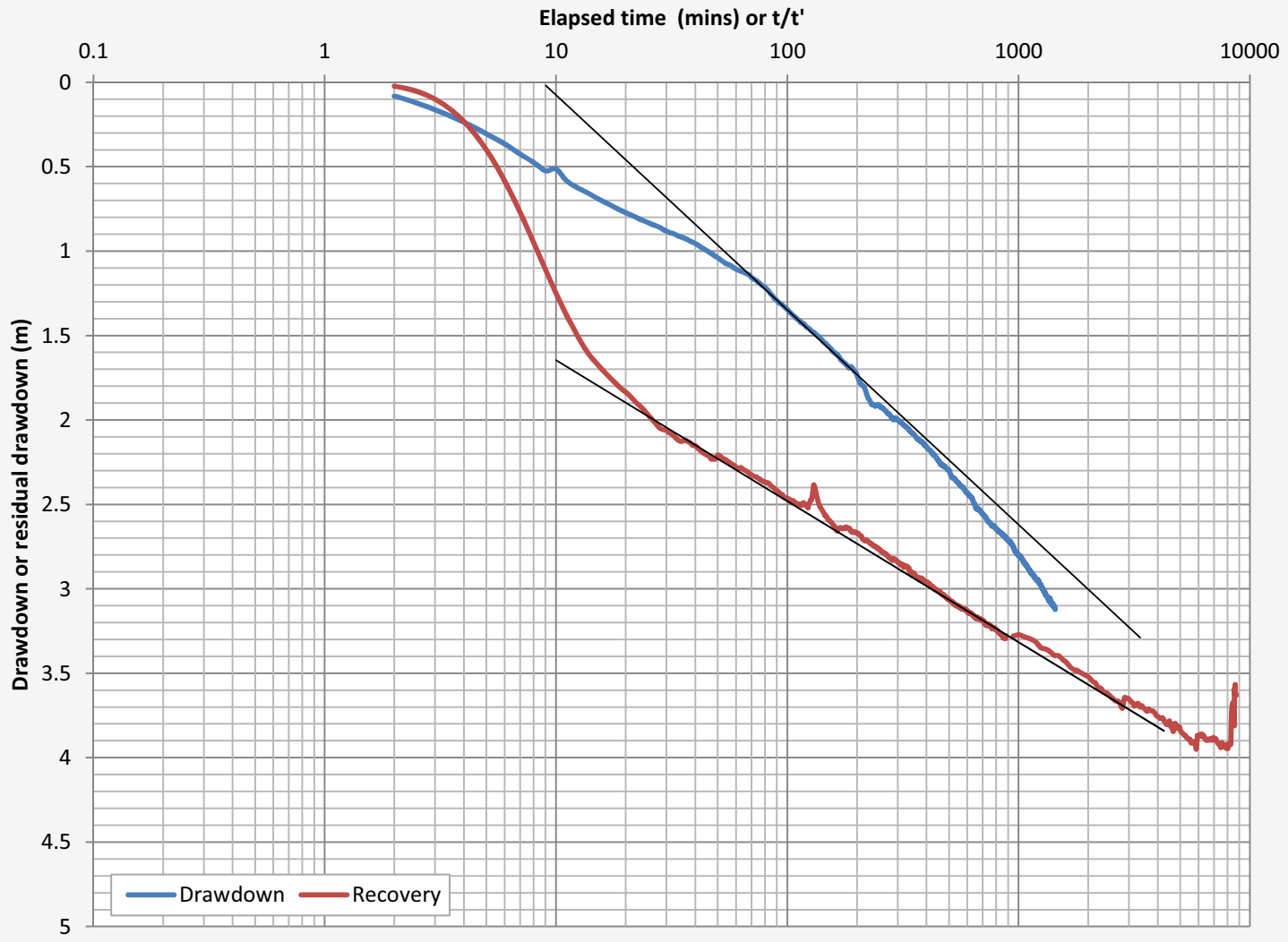
Hydraulic conductivity
k=T/d
=154.6/12.5
=12.4 m/day (drawdown)

=131.4/12.5
=10.5 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*154.6*0.000764/6.8^2$
$=5.7 \times 10^{-3}$ (drawdown)

(Artesian observation bore)

Figure B.2: GW3B 24 hour test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=4.4 L/s
=380.2 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*1.4)
=49.7 m^2/day (drawdown)

=2.3*380.2/(4*∏*0.9)
=77.3 m^2/day (recovery)

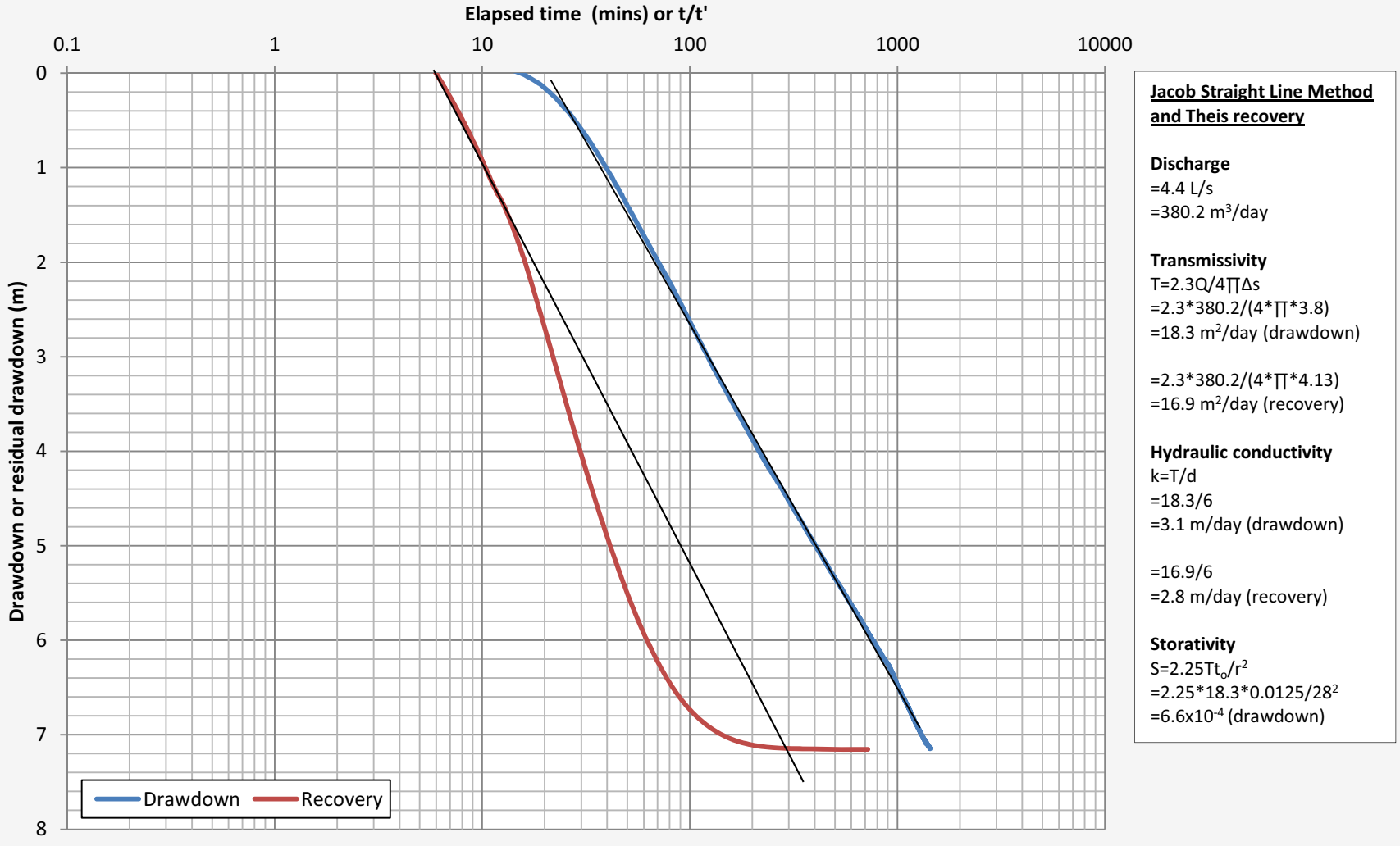
Hydraulic conductivity
K=T/b
=49.7/6
=8.3 m/day (drawdown)

=77.3/6
=12.9 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*49.7*0.0056/12.5^2$
$=4.7x10^{-3}$ (drawdown)

(Artesian observation bore)

Figure B.3: GW3C 24 hour test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=4.4 L/s
=380.2 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*3.8)
=18.3 m^2/day (drawdown)

=2.3*380.2/(4*∏*4.13)
=16.9 m^2/day (recovery)

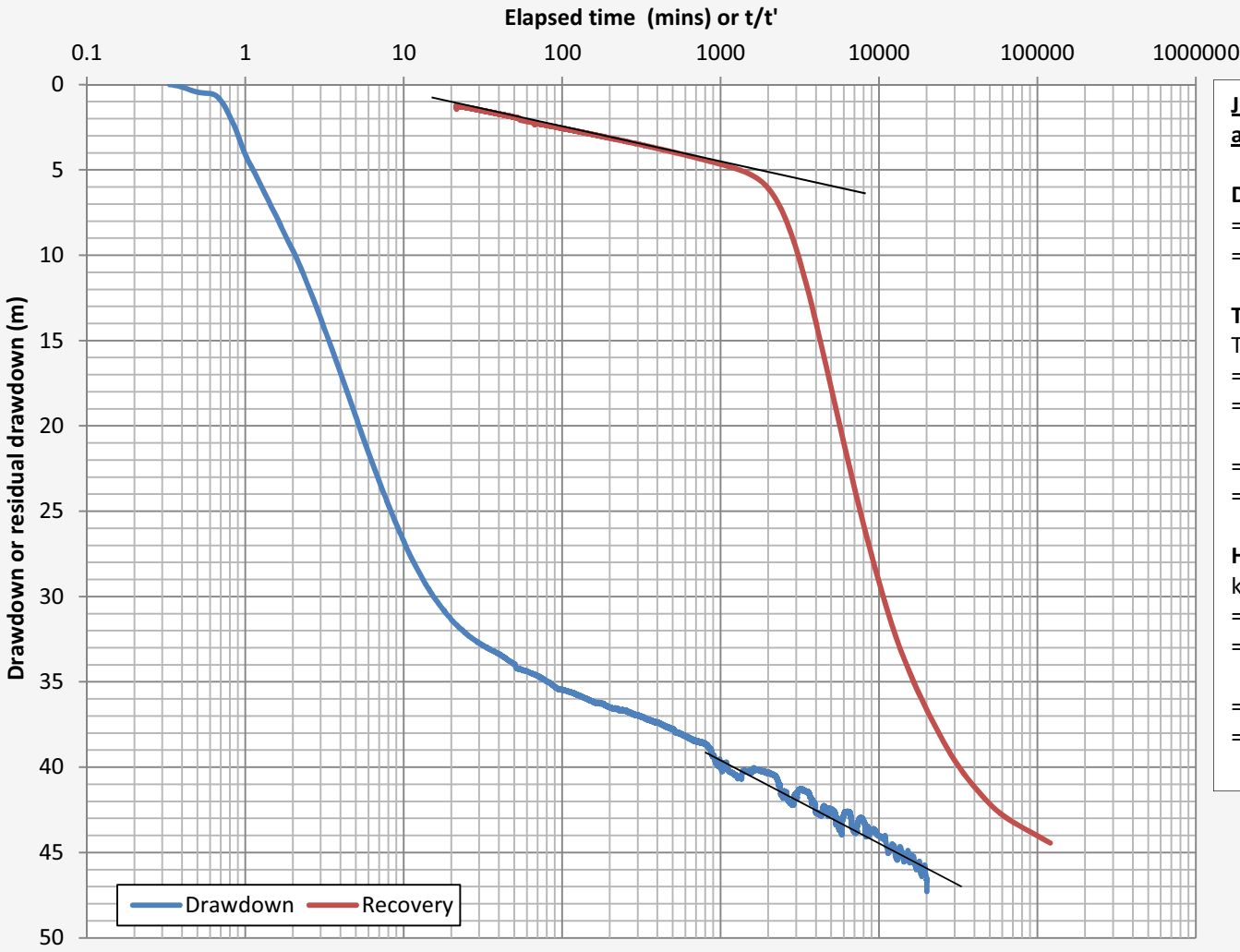
Hydraulic conductivity
k=T/d
=18.3/6
=3.1 m/day (drawdown)

=16.9/6
=2.8 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*18.3*0.0125/28^2$
$=6.6x10^{-4}$ (drawdown)

(Artesian observation bore)

Figure B.4: GW3E 24 hour test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=4.4 L/s
=380.2 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*5)
=13.9 m^2/day (drawdown)

=2.3*380.2/(4*∏*1.9)
=36.6 m^2/day (recovery)

Hydraulic conductivity
k=T/d
=13.9/12.5
=0.9 m/day (drawdown)

=36.6/12.5
=2.9 m/day (recovery)

(Artesian test production bore)

Figure B.5: GW3_TPB 14 day test analysis

Jacob Straight Line Method and Theis recovery

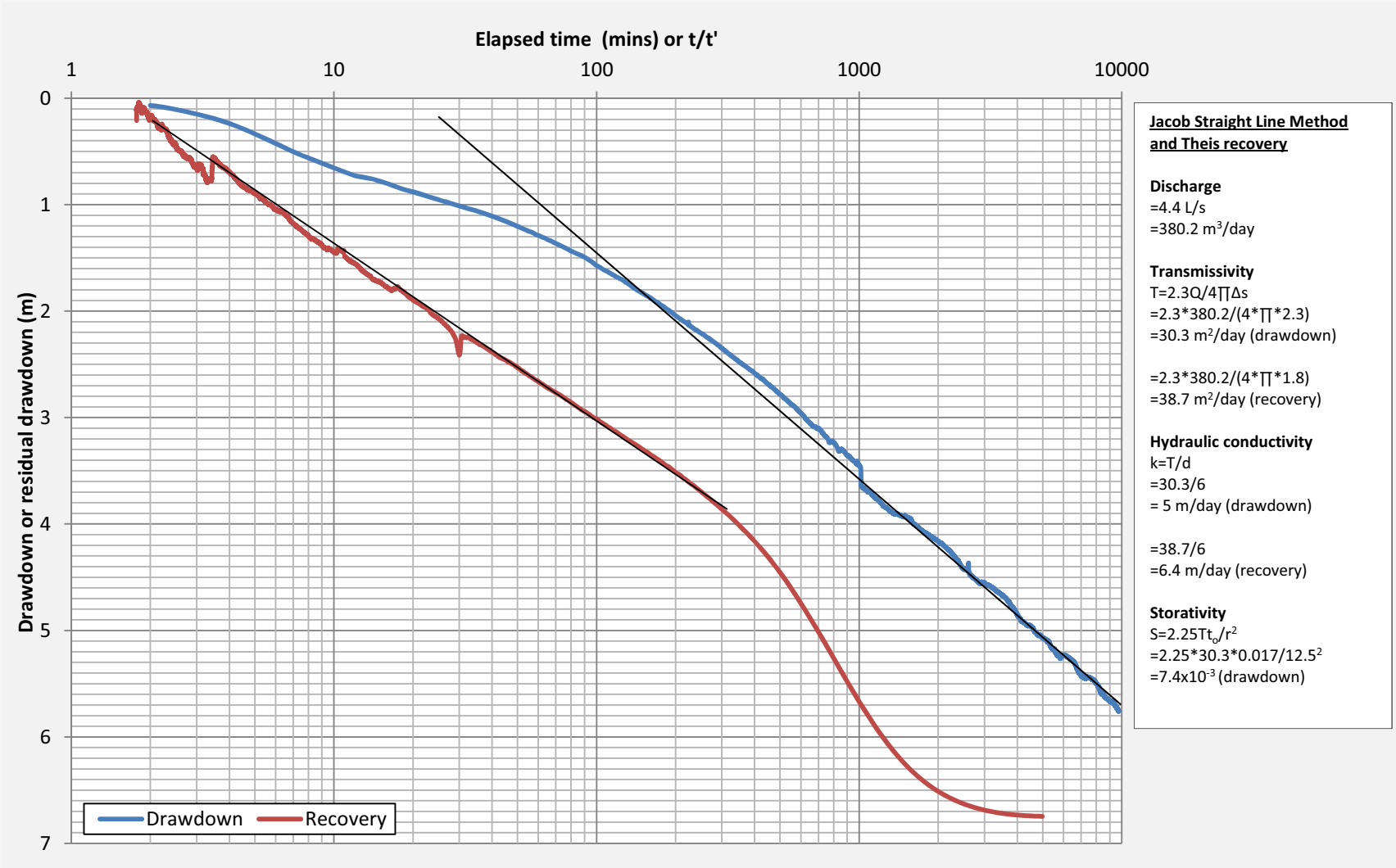
Discharge
=4.4 L/s
=380.2 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*1.6)
=43.5 m^2/day (recovery)

Hydraulic conductivity
k=T/d
=43.5/12.5
=3.5 m/day (recovery)

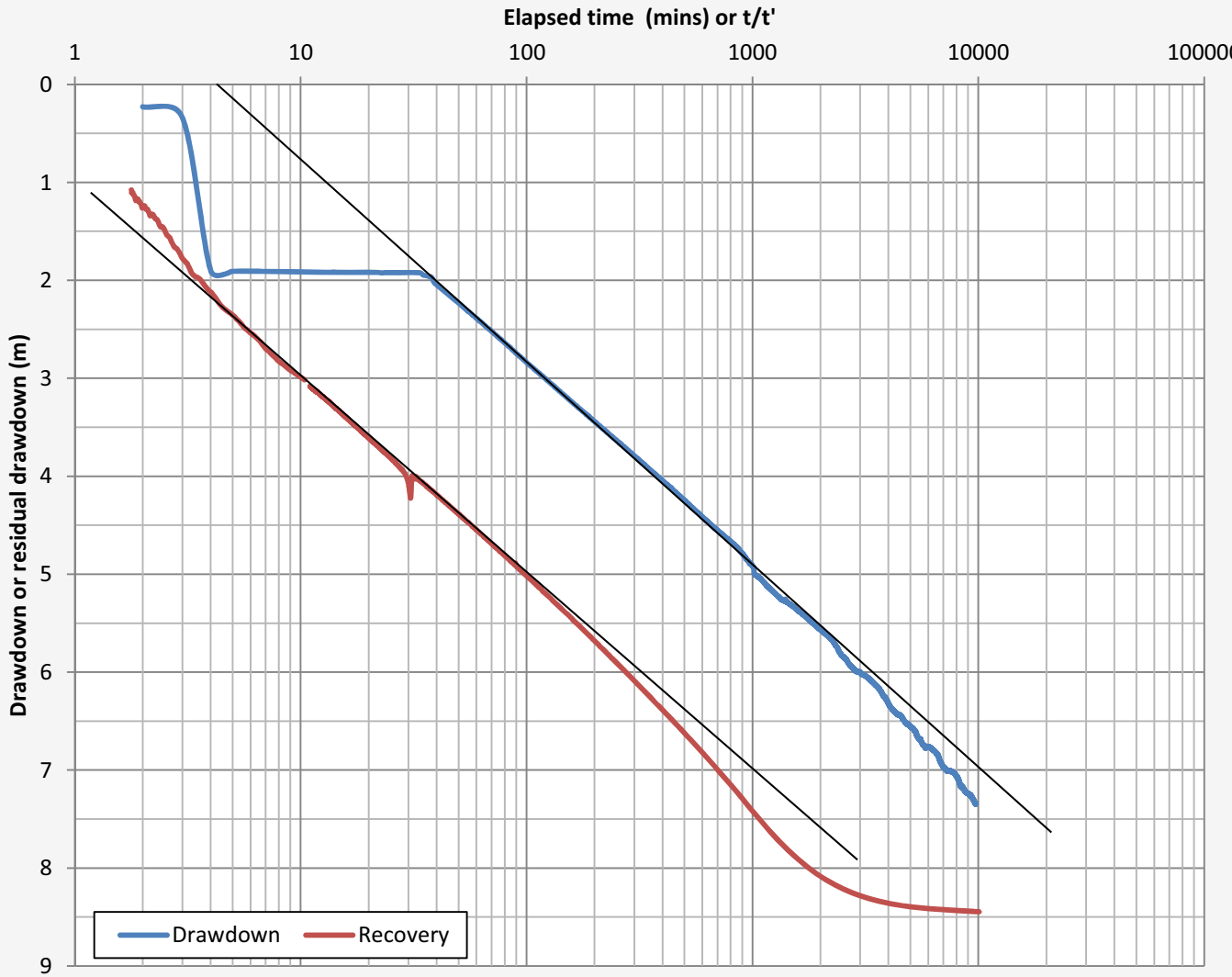
(Artesian observation bore)

Figure B.6: Stage 1 GW3B 14 day test analysis



(Artesian observation bore)

Figure B.7: GW3C 14 day analysis



Jacob Straight Line Method and Theis recovery

Discharge
=4.4 L/s
=380.2 m^3/day

Transmissivity
=2.3*380.2/(4*∏*2.1)
=33.15 m^2/day (drawdown)

=2.3*380.2/(4*∏*2.2)
=31.6 m^2/day (recovery)

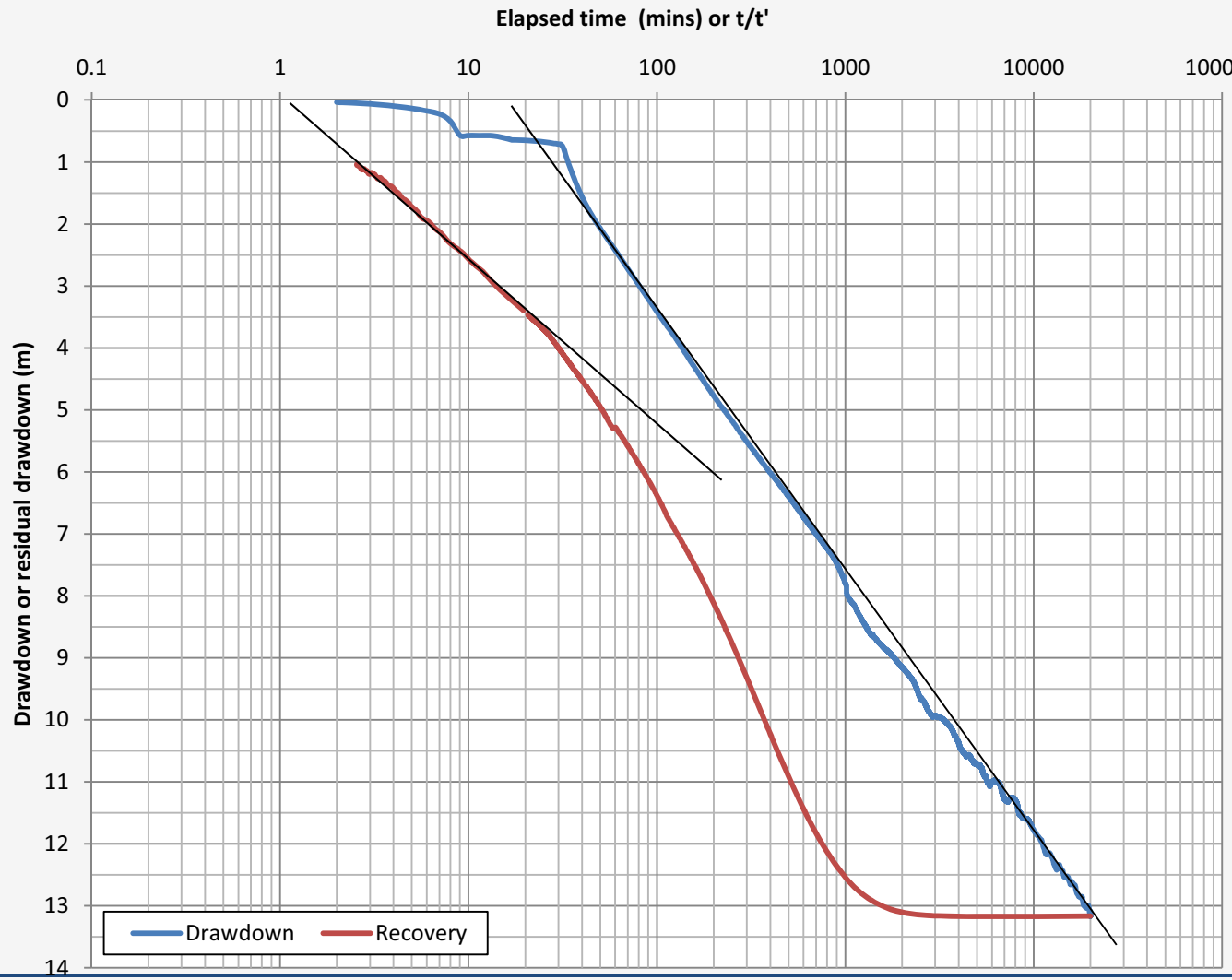
Hydraulic conductivity
k=T/d
=33.2/12
=2.8 m/day (drawdown)

=31.6/12
=2.6 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*33.2*0.003/20.4^2$
$=5.4x10^{-4}$(drawdown)

(Artesian observation bore)

Figure B.8: GW3D 14 day analysis



Jacob Straight Line Method and Theis recovery

Discharge
=4.4 L/s
=380.2 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*4.2)
=16.6 m^2/day (drawdown)

=2.3*380.2/(4*∏*2.65)
=26.3 m^2/day (recovery)

Hydraulic conductivity
k=T/d
=16.6/6
=2.8 m/day (drawdown)

=26.3/6
=4.4 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*16.6*0.0125/28^2$
$=6.0x10^{-4}$(drawdown)

(Artesian observation bore)

Figure B.9: Stage 1 GW3E 14 day analysis

Jacob Straight Line Method and Theis recovery

Discharge
=3.5 L/s
=302.4 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*302.4/(4*∏*1.25)
=44.3 m^2/day (drawdown)

=2.3*302.4/(4*∏*0.65)
=85.2 m^2/day (recovery)

Hydraulic conductivity
k=T/d
=44.3/18
=2.5 m/day (drawdown)

=85.2/18
=4.7 m/day (recovery)

(Test production bore)

Figure B.10: Stage 1 GW5_TPB 24 hour test analysis

Jacob Straight Line Method and Theis recovery

Discharge
=3.5 L/s
=302.4 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*302.4/(4*∏*1.05)
=52.7 m^2/day (drawdown)

=2.3*302.4/(4*∏*0.8)
=69.2 m^2/day (recovery)

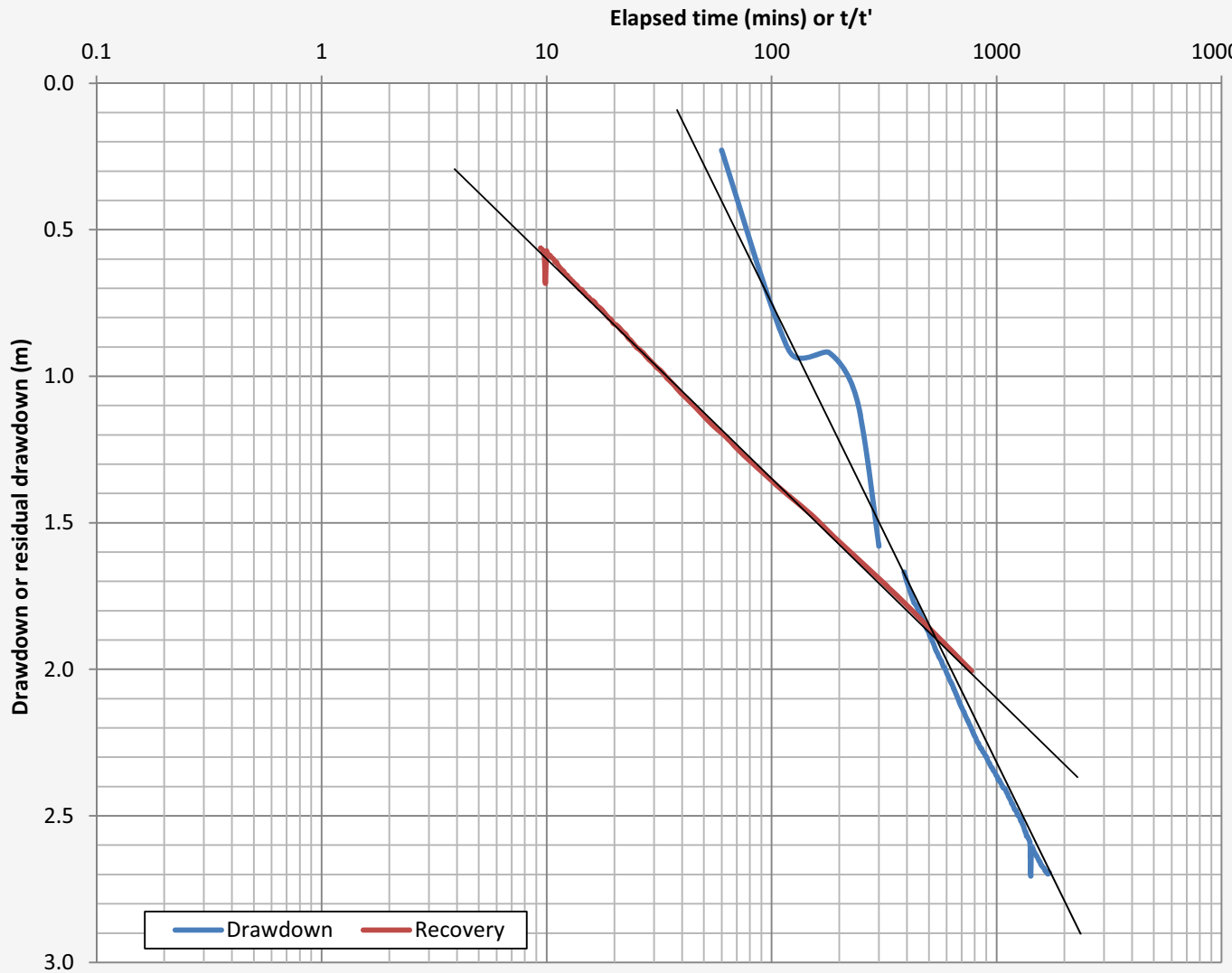
Hydraulic conductivity
k=T/d
=52.7/3
=17.6 m/day (drawdown)

=69.2/3
=23.1 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*52.7*0.076/17.4^2$
$=3x10^{-2}$ (drawdown)

(Observation bore)

Figure B.11: Stage 1 GW5B 24 hour test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=3.5 L/s
=302.4 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*302.4/(4*∏*1.6)
=34.6 m^2/day (drawdown)

=2.3*302.4/(4*∏*0.8)
=69.2 m^2/day (recovery)

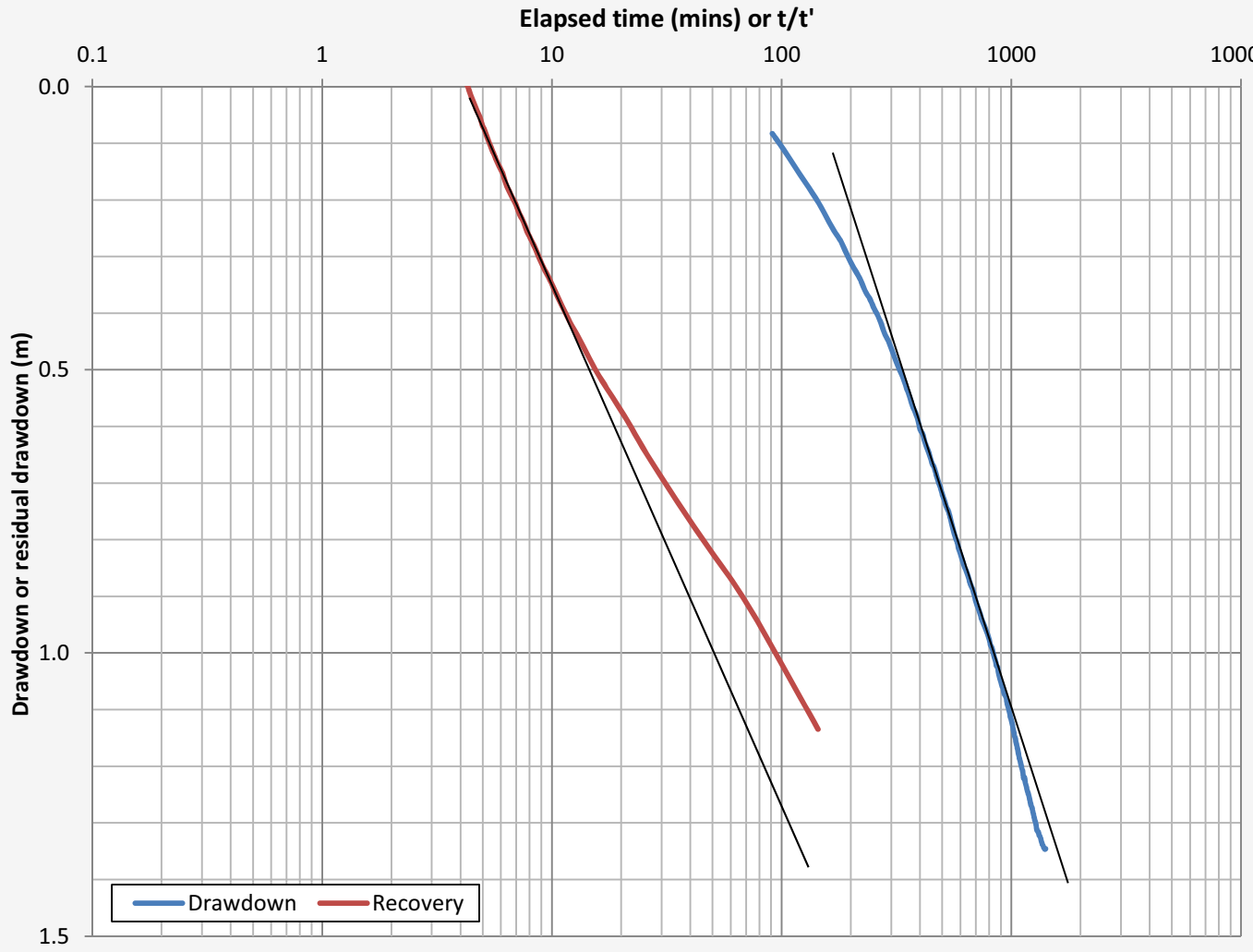
Hydraulic conductivity
k=T/d
=34.6/6
=5.8 m/day (drawdown)

=69.2/6
=11.5 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*34.6*0.022/24.1^2$
$=2.9x10^{-3}$ (drawdown)

(Observation bore)

Figure B.12: Stage 1 GW5C 24 hour test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=3.5 L/s
=302.4 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*302.4/(4*∏*1.35)
=41 m^2/day (drawdown)

=2.3*302.4/(4*∏*1)
=55.4 m^2/day (recovery)

Hydraulic conductivity
k=T/d
=41/6
=6.8 m/day (drawdown)

=55.4/6
=9.2 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*41*0.122/31.4^2$
$=1.1x10^{-2}$ (drawdown)

(Observation bore)

Figure B.13: Stage 1 GW5D 24 hour test analysis

Jacob Straight Line Method and Theis Recovery

Discharge
=4.4 L/s
=380.2 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*8.2)
=8.5 m^2/day (drawdown)

=2.3*380.2/(4*∏*4.5)
=15.5 m^2/day (recovery)

Hydraulic conductivity
k=T/d
=8.5/55
=0.15 m/day (drawdown)

=15.5/55
=0.28 m/day (recovery)

(Artesian test production bore)

Figure B.14: Stage 1 GW7_TPB 24 hour test analysis

Jacob Straight Line Method and Theis recovery

Discharge
=4.4 L/s
=380.2 m^3/day

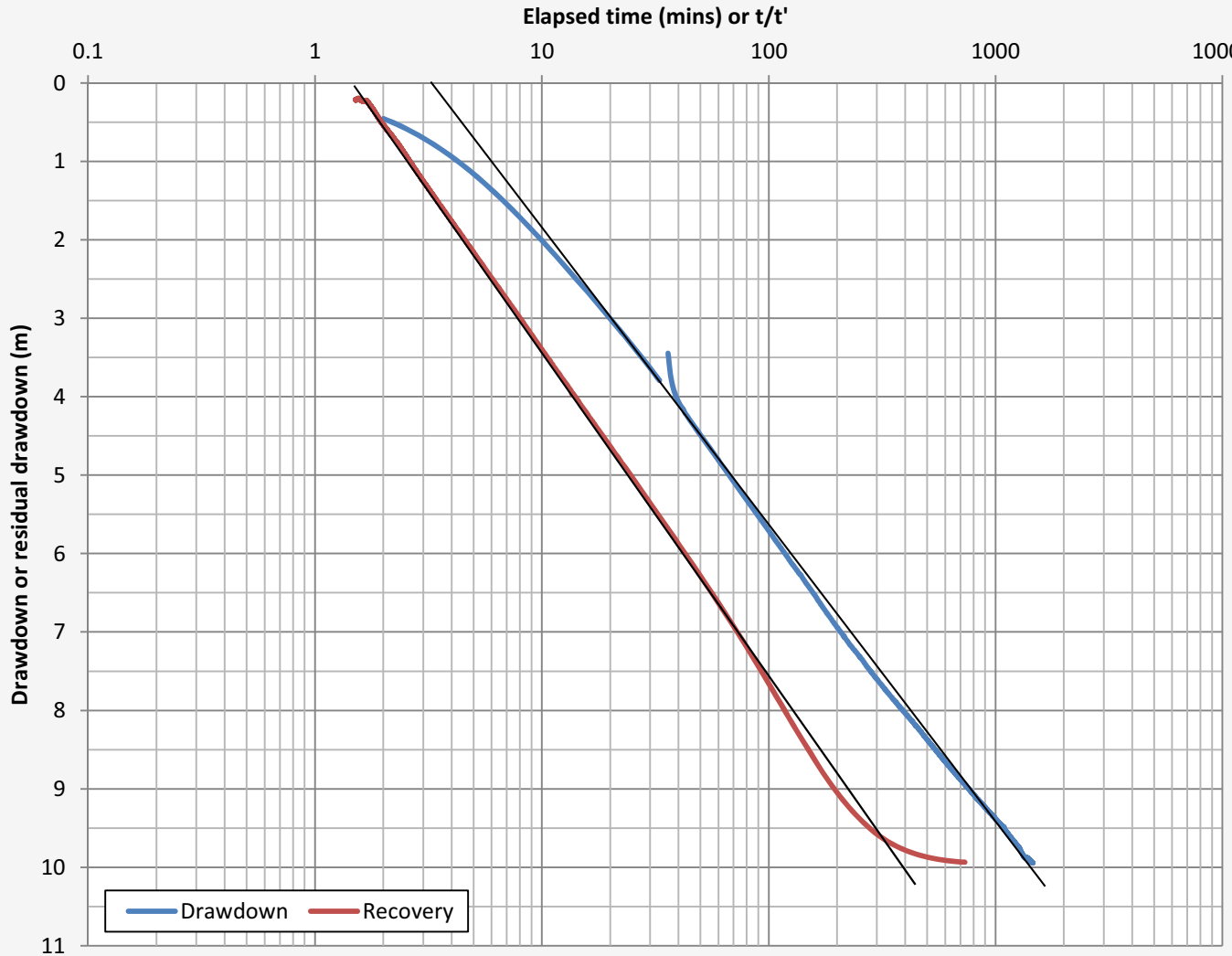
Transmissivity
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*6.2)
=11.2 m^2/day
(drawdown/recovery)

Hydraulic conductivity
k=T/d
=11.2/3
=3.7 m/day
(drawdown/recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*11.2*0.00625/29.5^2$
$=1.8x10^{-4}$ (drawdown)

(Artesian observation bore)

Figure B.15: Stage 1 GW7C 24 hour test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=4.4 L/s
=380.2 m^3/day

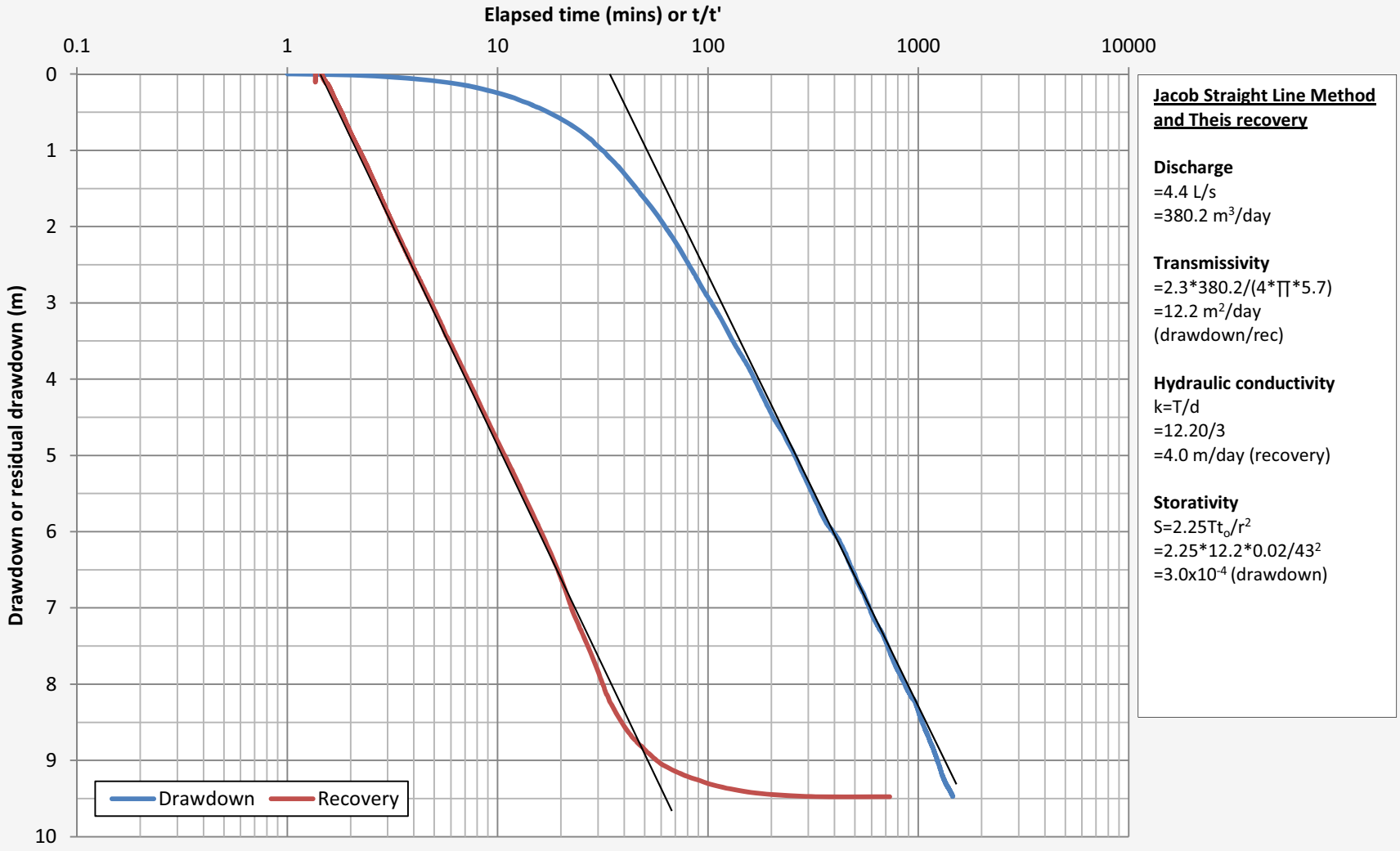
Transmissivity
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*4.0)
=17.4 m^2/day
(drawdown/recovery)

Hydraulic conductivity
k=T/d
=17.4/3
=5.8 m/day
(drawdown/recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*17.4*0.0022/36.3^2$
$=6.5x10^{-5}$ (drawdown)

(Observation bore)

Figure B.16: Stage 1 GW7D 24 hour test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=4.4 L/s
=380.2 m^3/day

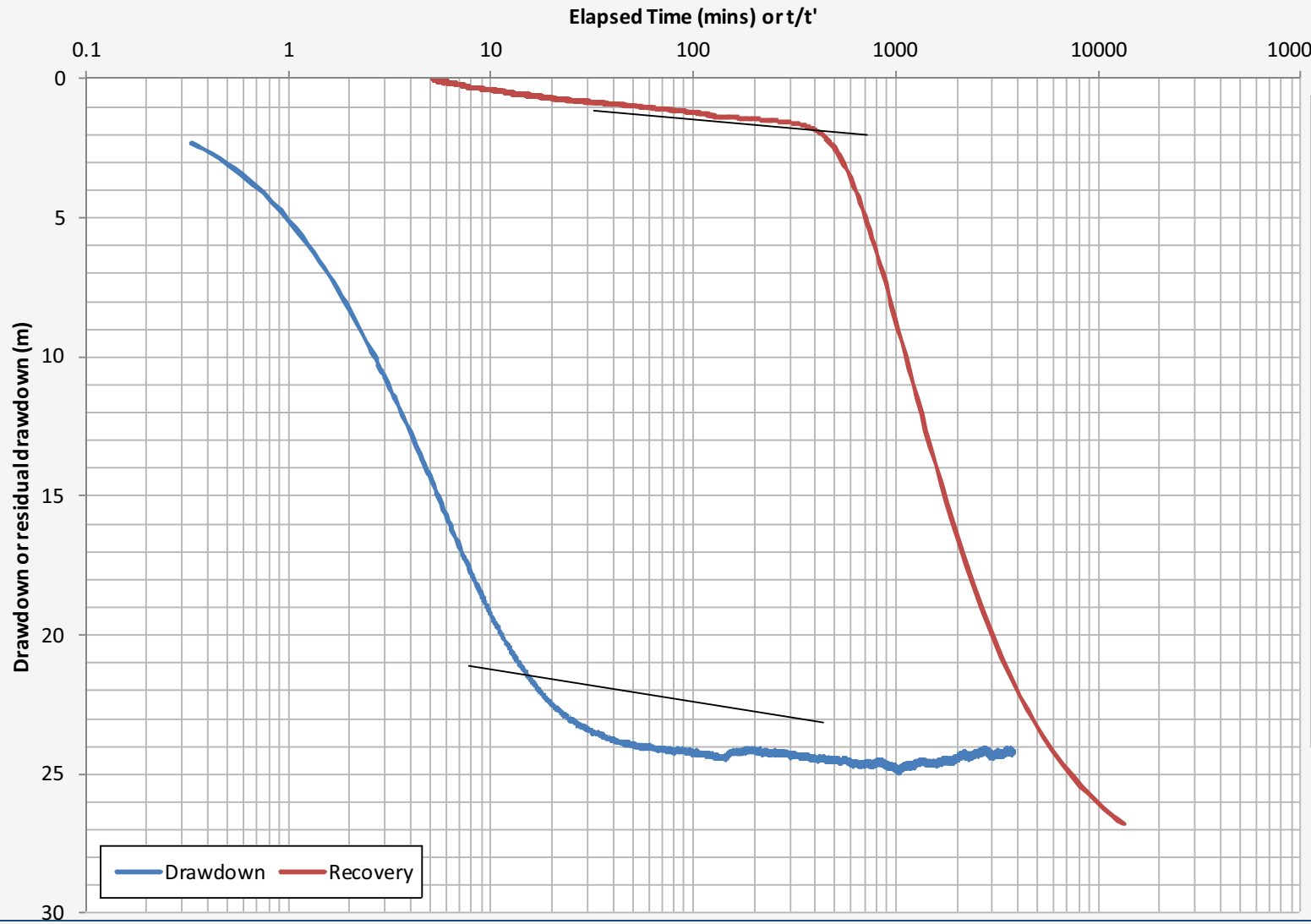
Transmissivity
=2.3*380.2/(4*∏*5.7)
=12.2 m^2/day
(drawdown/rec)

Hydraulic conductivity
k=T/d
=12.20/3
=4.0 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*12.2*0.02/43^2$
$=3.0x10^{-4}$ (drawdown)

(Artesian observation bore)

Figure B.17: Stage 1 GW7E 24 hour test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=1.8 L/s
=155.5m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*155.5/(4*∏*1)
=28.5 m^2/day (drawdown)

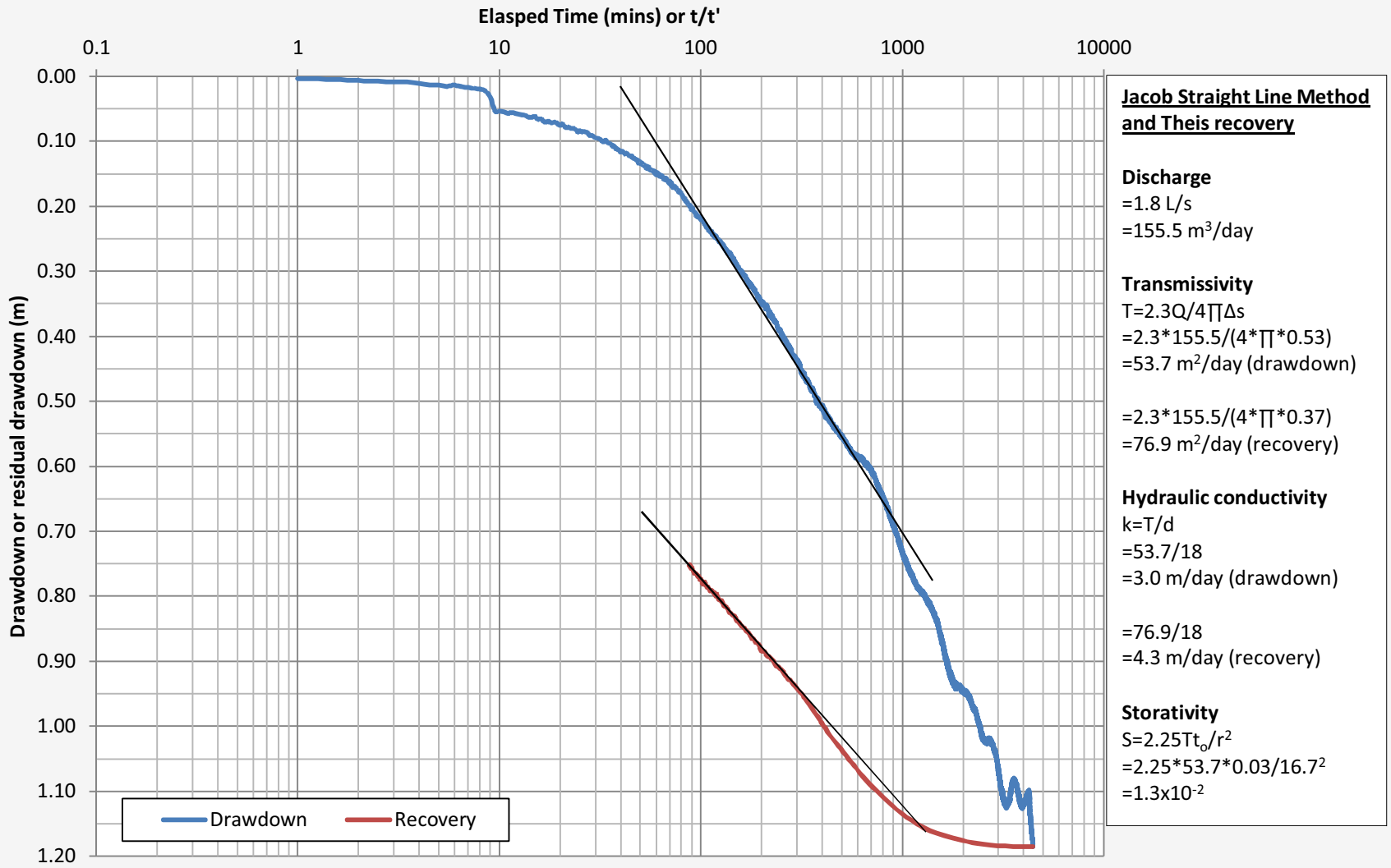
=2.3*155.5/(4*∏*0.9)
=31.6 m^2/day (recovery)

Hydraulic conductivity
k=T/d
=28.5/15
=1.9 m/day (drawdown)

=31.6/15
=2.1 m/day (recovery)

(Test production bore)

Figure B.18: GW22_TPB 3 day test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=1.8 L/s
=155.5 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*155.5/(4*∏*0.53)
=53.7 m^2/day (drawdown)

=2.3*155.5/(4*∏*0.37)
=76.9 m^2/day (recovery)

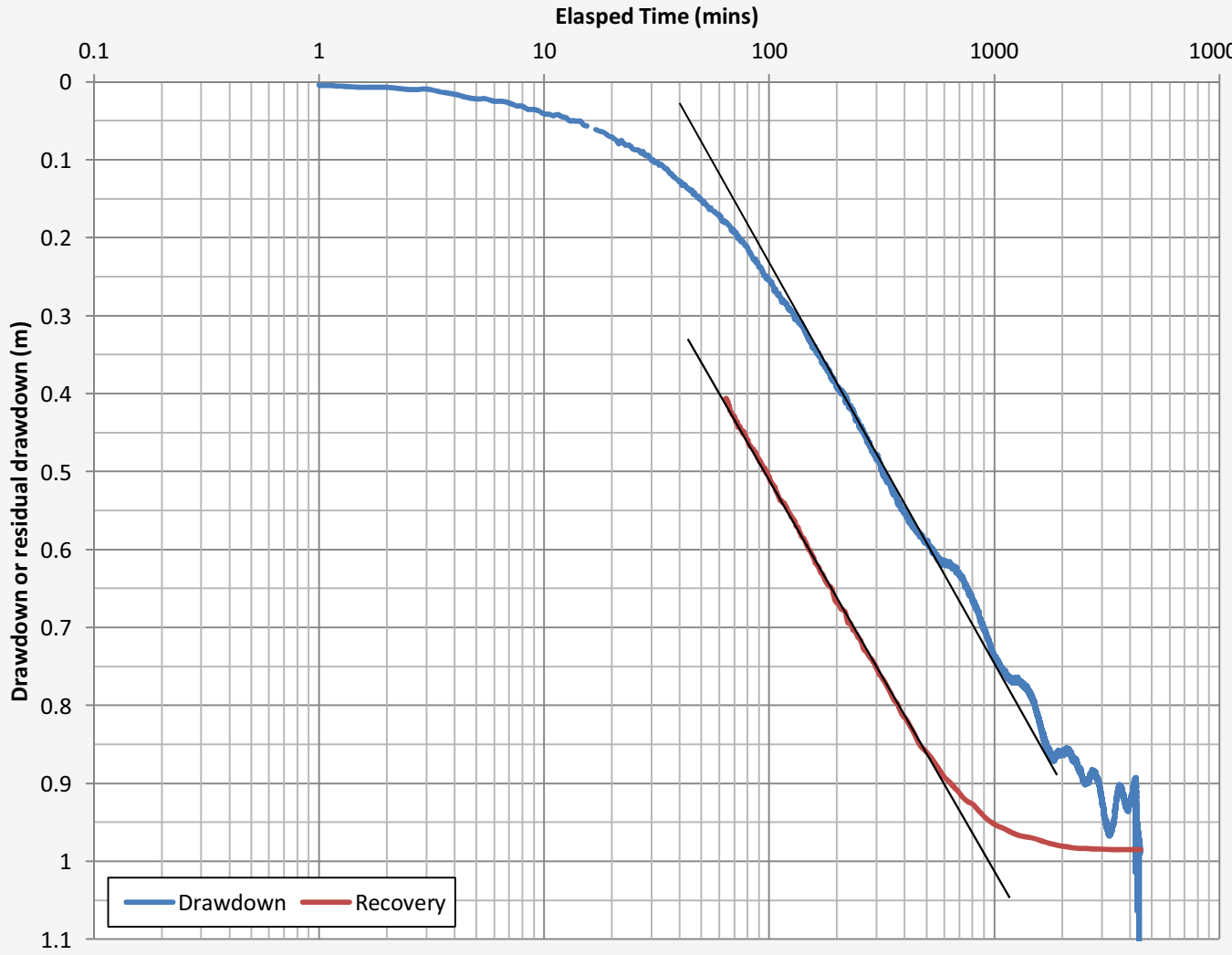
Hydraulic conductivity
k=T/d
=53.7/18
=3.0 m/day (drawdown)

=76.9/18
=4.3 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*53.7*0.03/16.7^2$
$=1.3x10^{-2}$

(Observation bore)

Figure B.19: GW5_TPB 3 day test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=1.8 L/s
=155.5 m^3/day

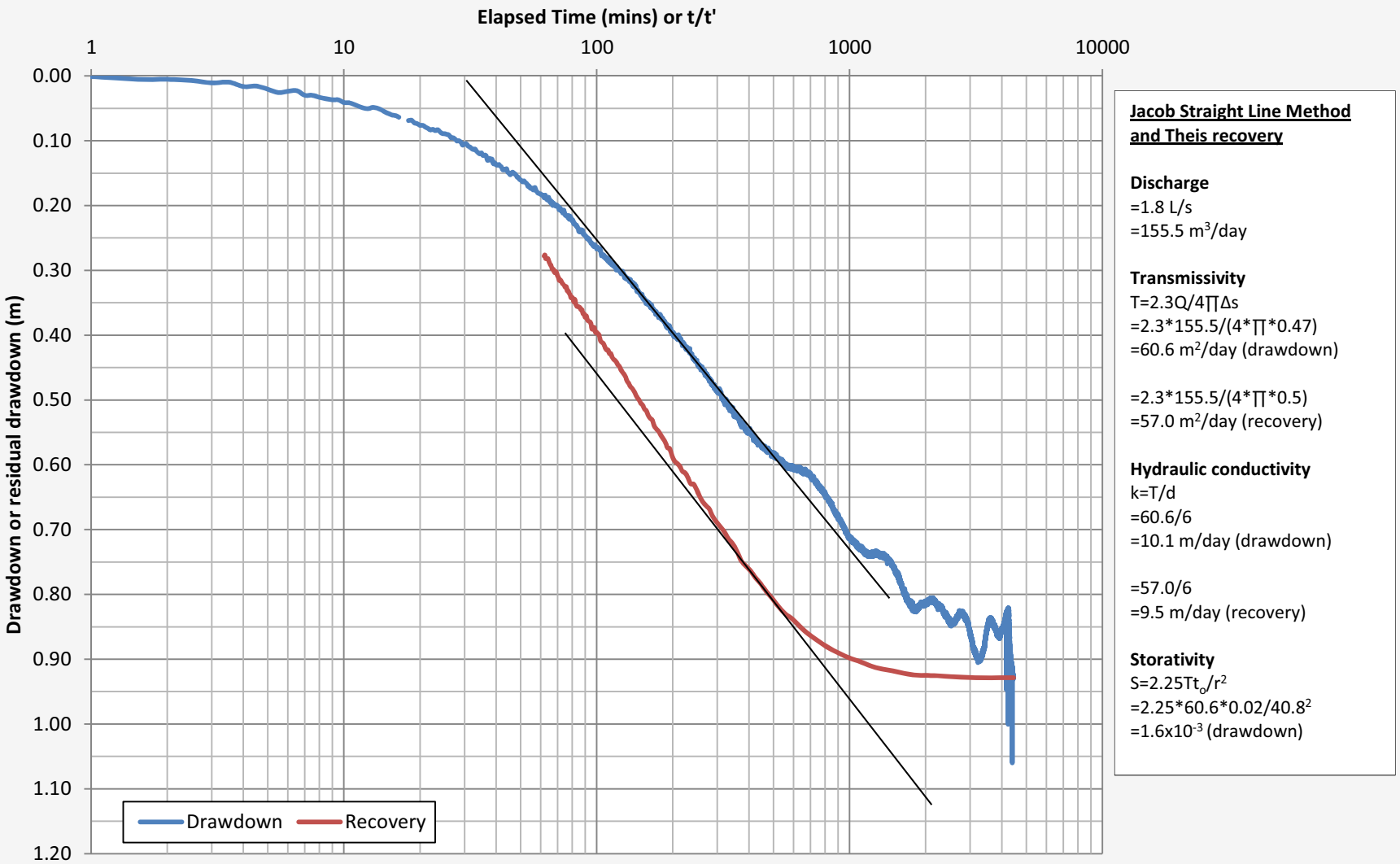
Transmissivity
T=2.3Q/4∏Δs
=2.3*155.5/(4*∏*0.51)
=55.8 m^2/day
(drawdown/recovery)

Hydraulic conductivity
k=T/d
=55.8/3
=18.6 m/day
(drawdown/recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*55.8*0.0245/34^2$
$=2.7x10^{-3}$

(Observation bore)

Figure B.20: GW5B 3 day test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=1.8 L/s
=155.5 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*155.5/(4*∏*0.47)
=60.6 m^2/day (drawdown)

=2.3*155.5/(4*∏*0.5)
=57.0 m^2/day (recovery)

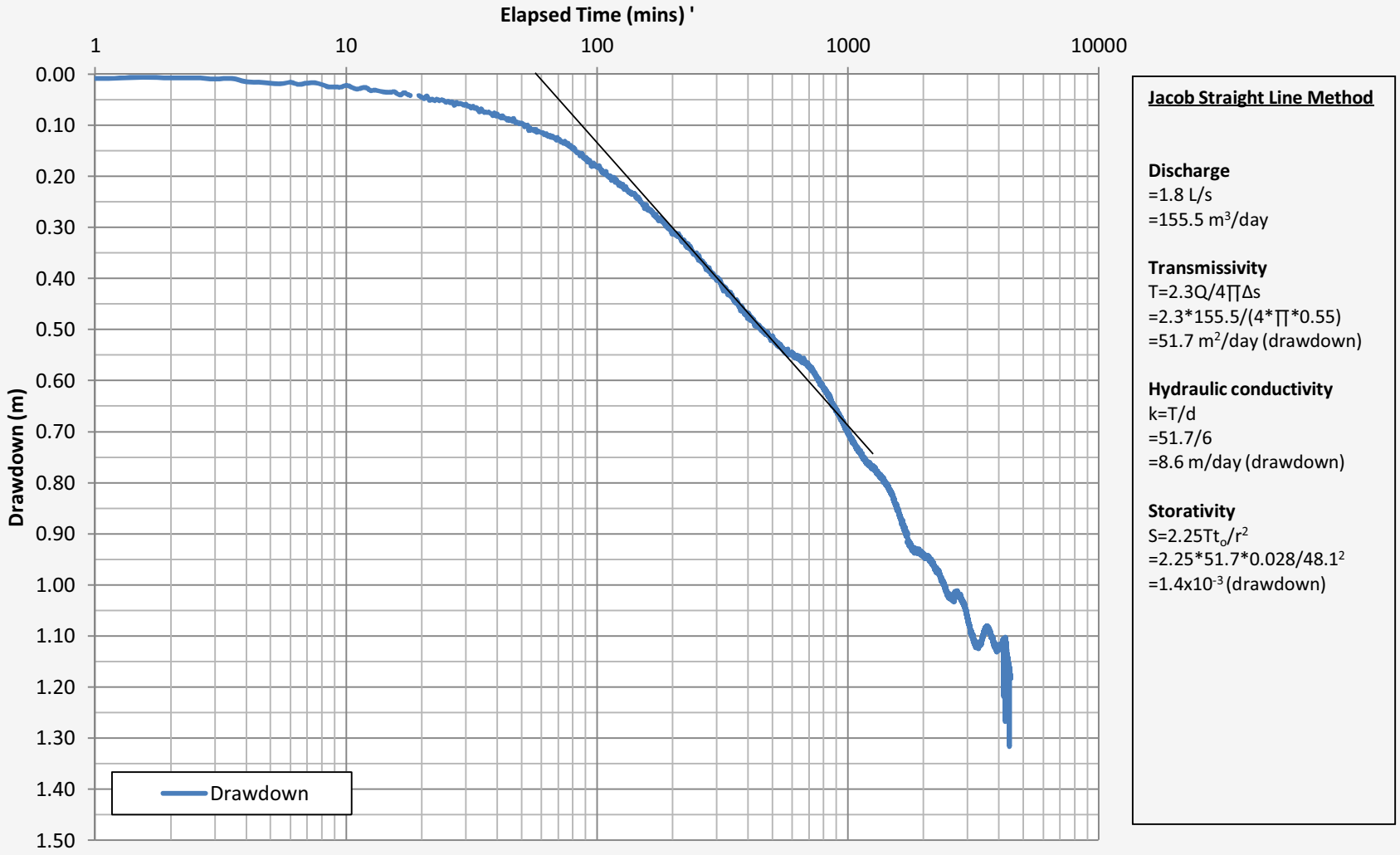
Hydraulic conductivity
k=T/d
=60.6/6
=10.1 m/day (drawdown)

=57.0/6
=9.5 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*60.6*0.02/40.8^2$
$=1.6x10^{-3}$ (drawdown)

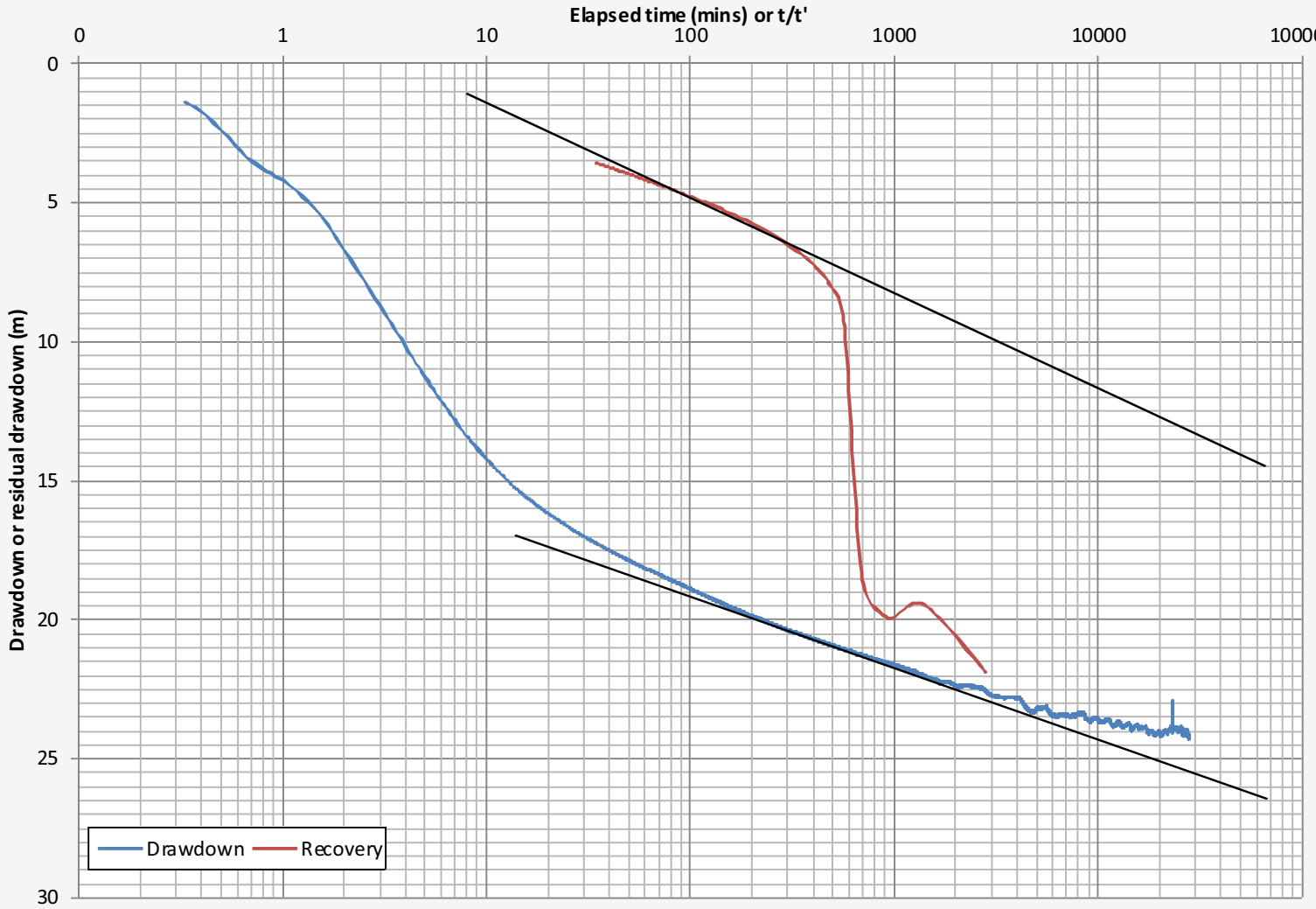
(Observation bore)

Figure B.21: GW5C 3 day test analysis



(Observation bore)

Figure B.22: GW5D 3 day test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=4.4 L/s
=380.2 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*2.5)
=27.9 m^2/day (drawdown)

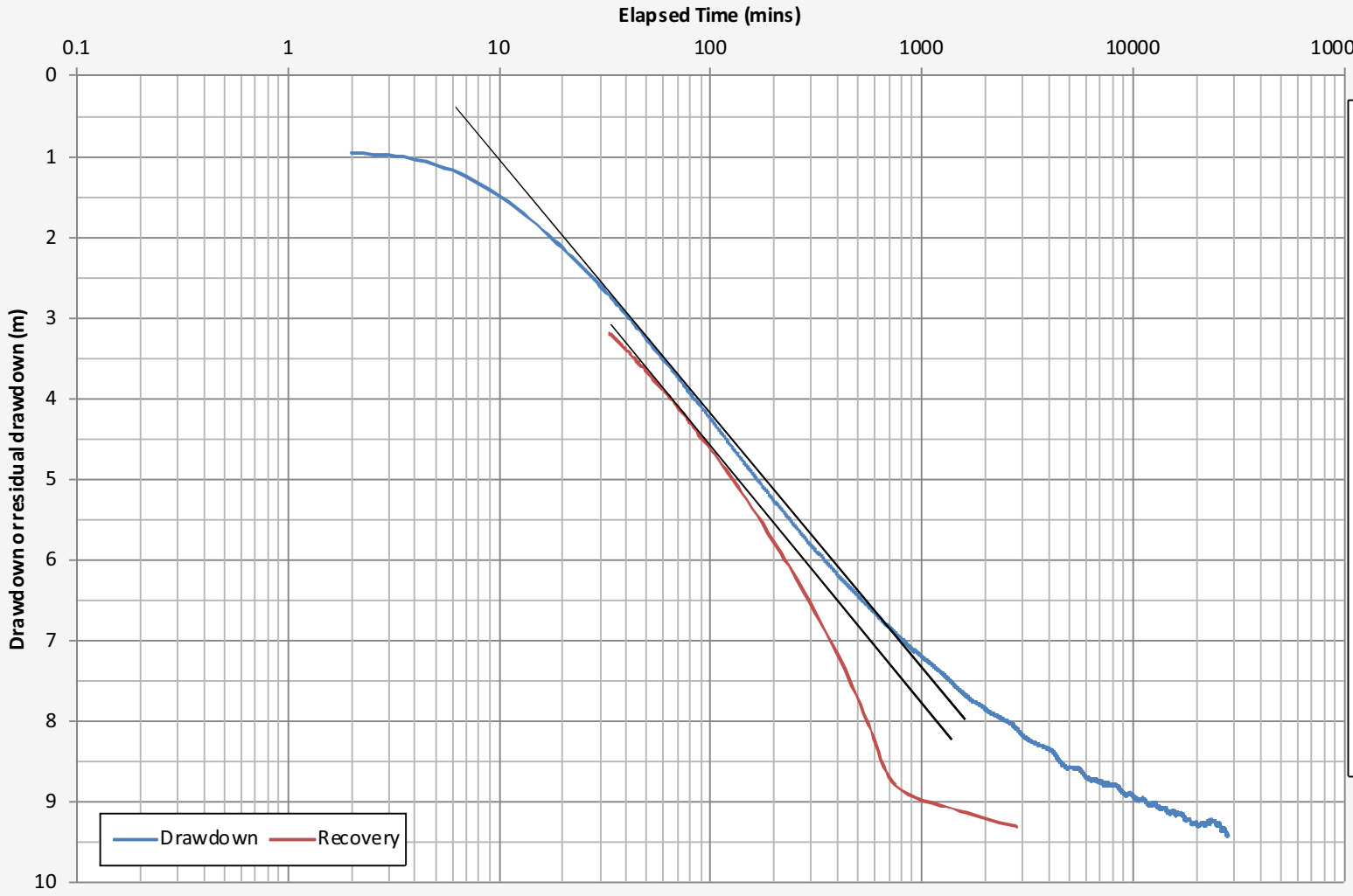
T=2.3Q/4∏Δs
=2.3*380.2/(4*∏*3)
=23.2 m^2/day (recovery)

Hydraulic conductivity
k=T/d
=27.9/55
=0.5 m/day (drawdown)

=23.2/55
=0.4 m/day (recovery)

(Test production bore)

Figure B.23: GW7_TPB 21 day test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=2.5l/s
=216m^3/day

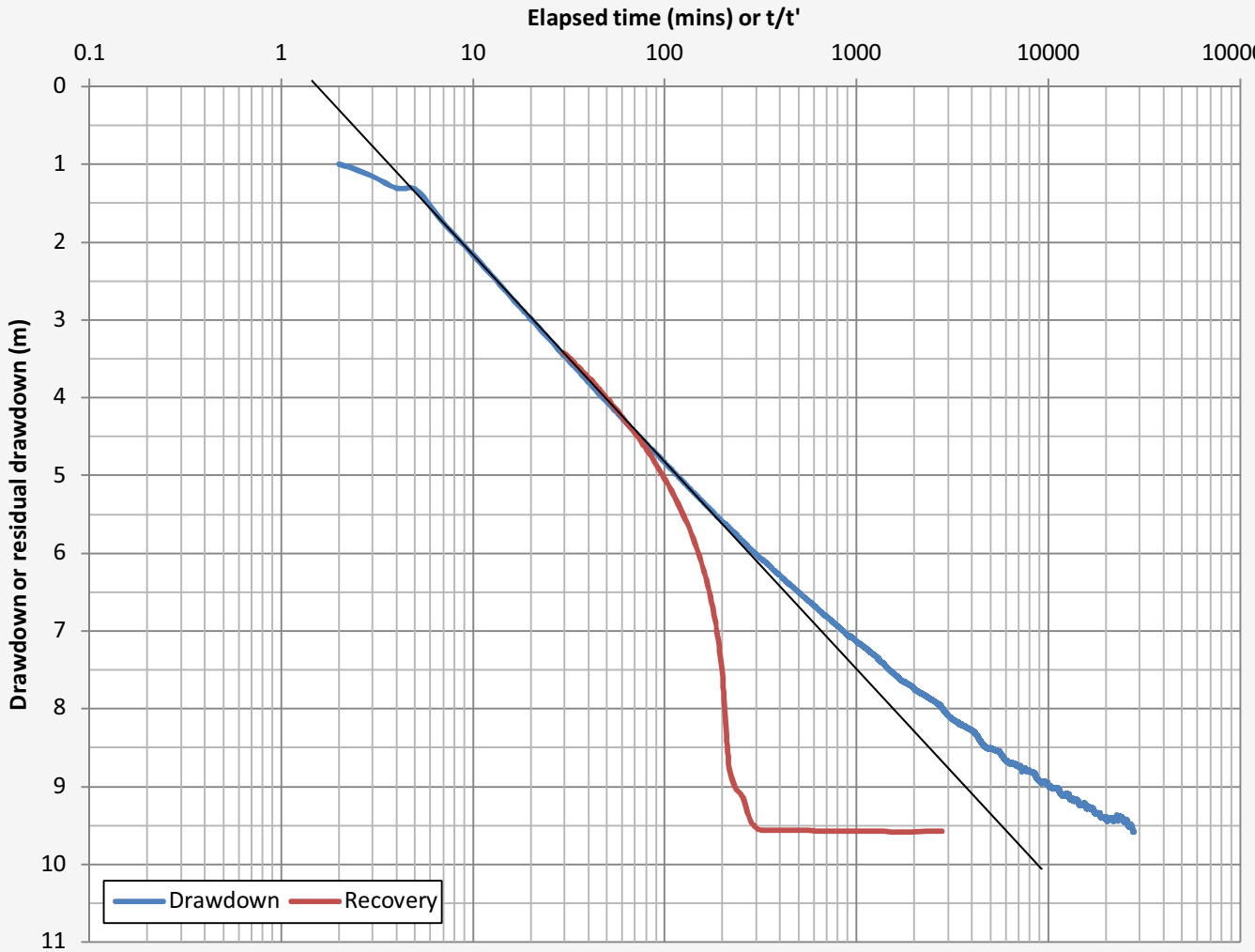
Transmissivity
T=2.3Q/4∏Δs
=2.3*216/(4*∏*3.2)
=12.2 m^2/day
(drawdown/rec)

Hydraulic conductivity
k=T/d
=12.2/3
=4.0 m/day (drawdown/rec)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*12.2*0.003/(29.5)^2$
$=9.5*10^{-5}$(drawdown)

(Observation bore)

Figure B.24: GW7C 21 day test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=216 m^3/day

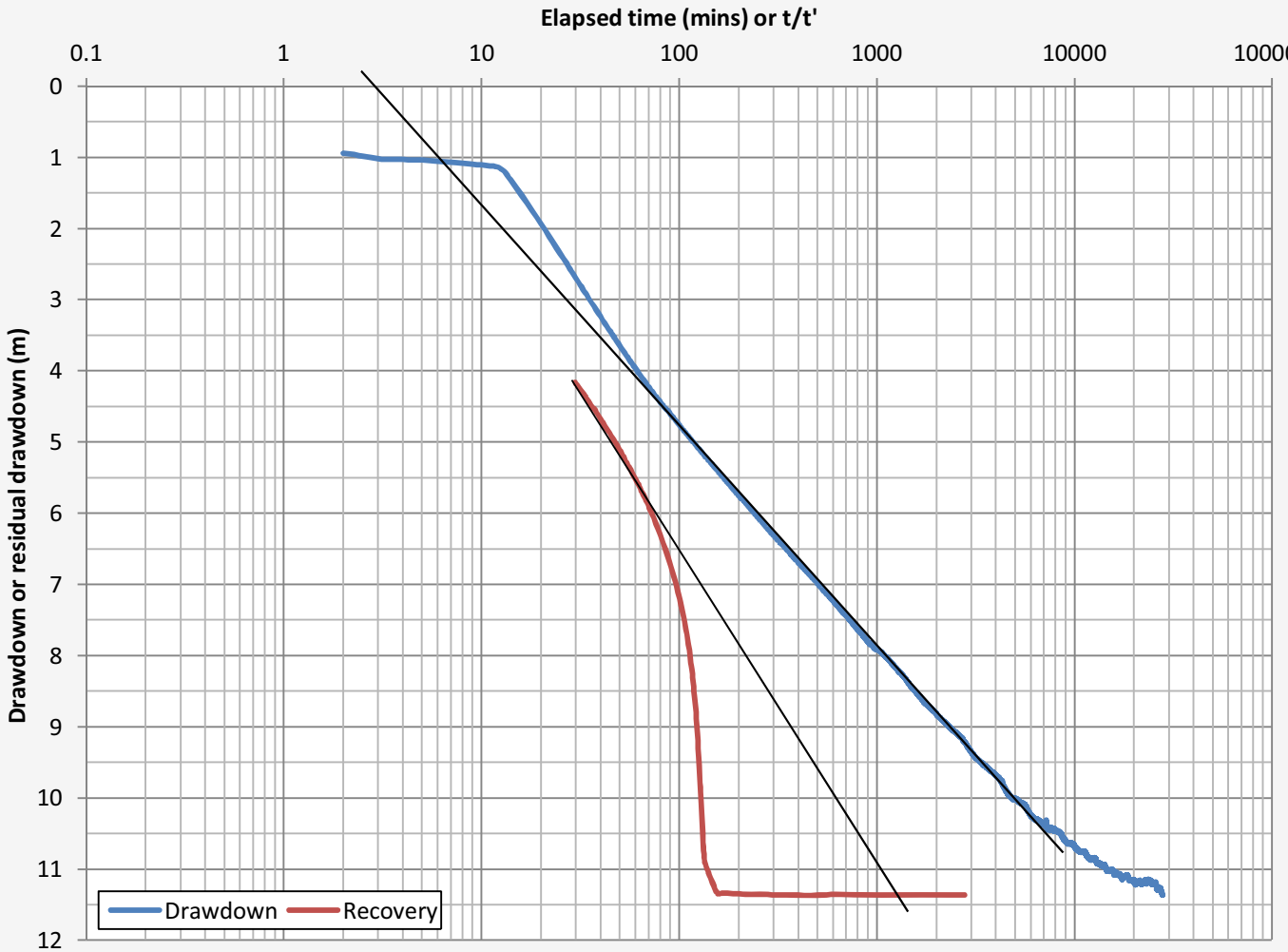
Transmissivity
T=2.3Q/4∏∆s
=2.3*216/(4*∏*2.8)
=14.1 m^2/day (drawdown and recovery)

Hydraulic conductivity
k=T/d
=14.1/3
=4.7 m/day (drawdown and recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*14.1*0.000764/(36.3)^2$
$=1.8*10^{-5}$(drawdown)

(Observation bore)

Figure B.25: GW7D 21 day test analysis



Jacob Straight Line Method and Theis recovery

Discharge
=216 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*216/(4*∏*3.2)
=12.4 m^2/day (drawdown)

=2.3*216/(4*∏*4.4)
=8.9 m^2/day (recovery)

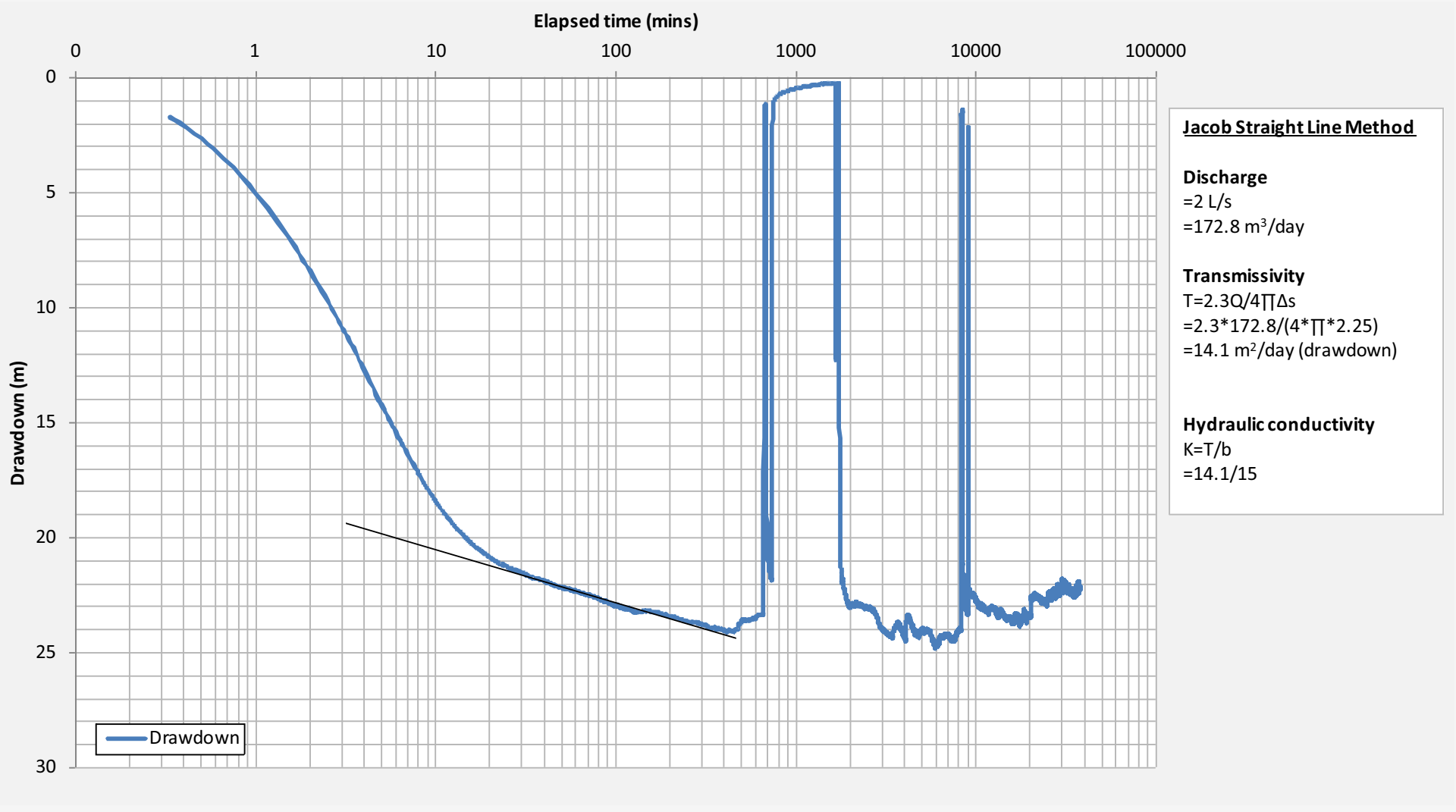
Hydraulic conductivity
k=T/d
=12.4/6
=2.1 m/day (drawdown)

=8.9/6
=1.5 m/day (recovery)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*12.4*0.002/(43)^2$
$=3x10^{-5}$ (drawdown)

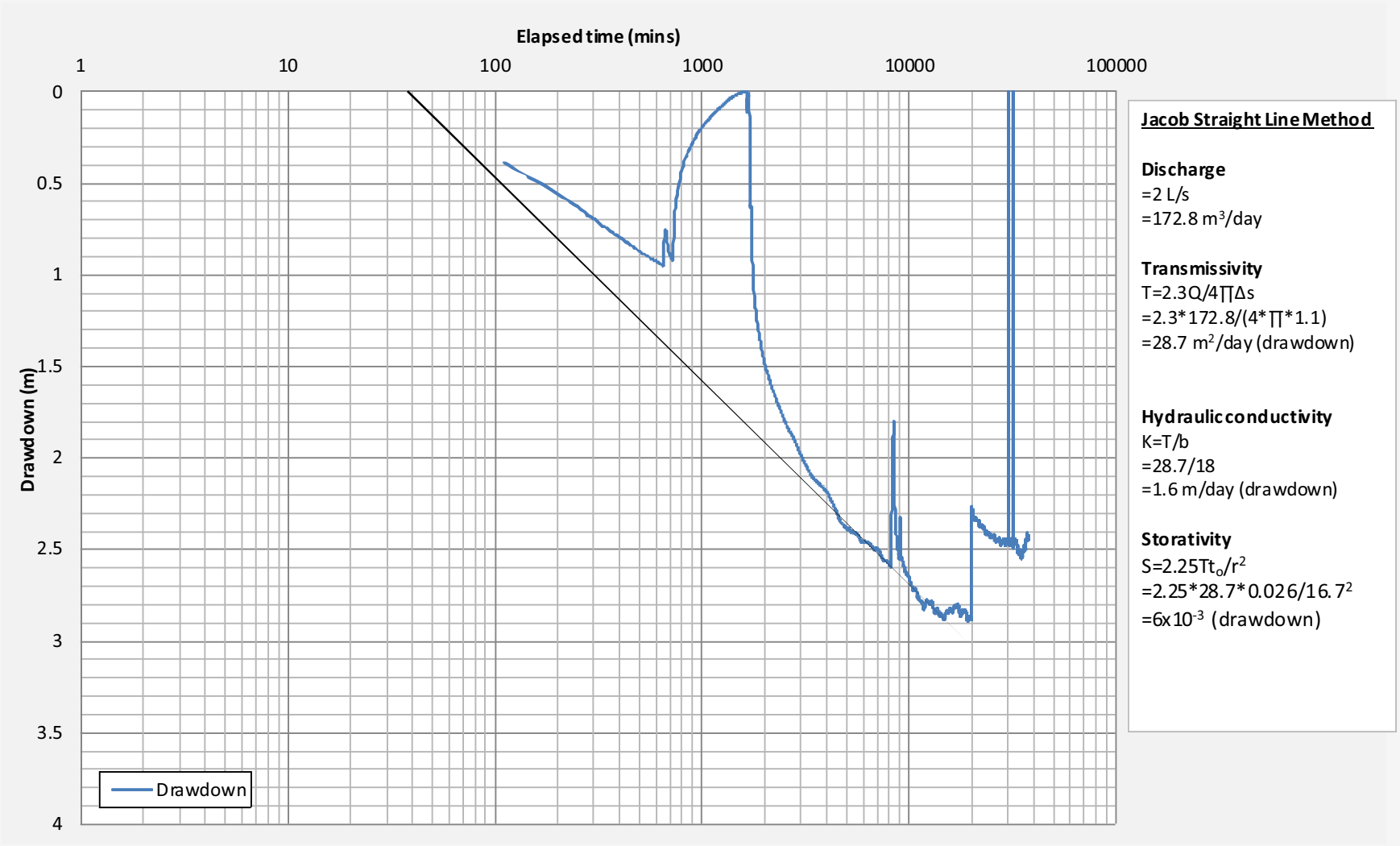
(Observation bore)

Figure B.26: GW7E 21 day test analysis



(Test production bore)

Figure B.27: GW22_TPB 21 day test analysis



Jacob Straight Line Method

Discharge
=2 L/s
=172.8 m^3/day

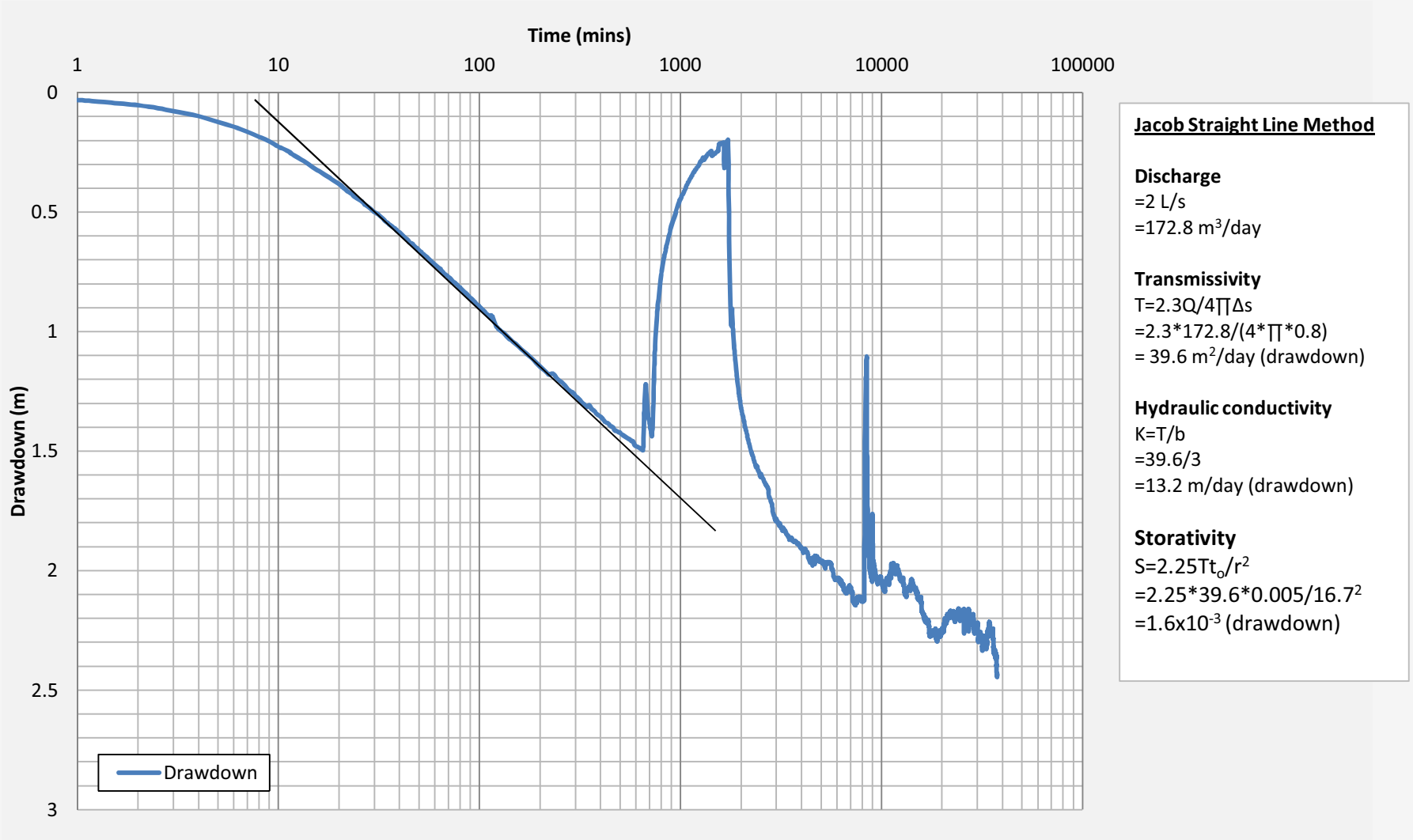
Transmissivity
T=2.3Q/4∏Δs
=2.3*172.8/(4*∏*1.1)
=28.7 m^2/day (drawdown)

Hydraulic conductivity
K=T/b
=28.7/18
=1.6 m/day (drawdown)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*28.7*0.026/16.7^2$
$=6x10^{-3}$ (drawdown)

(Test production bore)

Figure B.28: GW5_TPB 21 day test analysis



Jacob Straight Line Method

Discharge
=2 L/s
=172.8 m^3/day

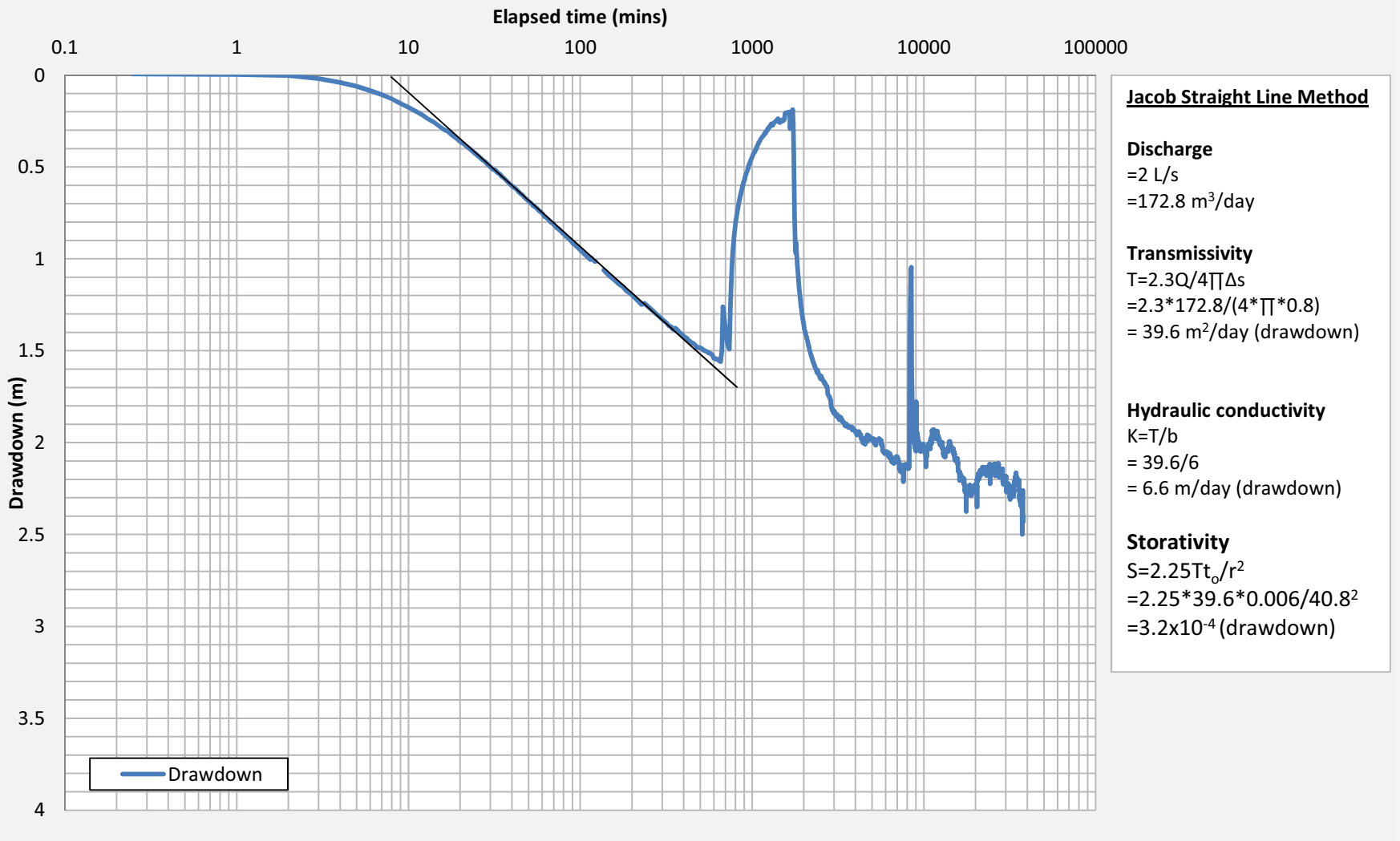
Transmissivity
T=2.3Q/4∏Δs
=2.3*172.8/(4*∏*0.8)
= 39.6 m^2/day (drawdown)

Hydraulic conductivity
K=T/b
=39.6/3
=13.2 m/day (drawdown)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*39.6*0.005/16.7^2$
$=1.6x10^{-3}$ (drawdown)

(Observation bore)

Figure B.29: GW5B 21 day test analysis



Jacob Straight Line Method

Discharge
=2 L/s
=172.8 m^3/day

Transmissivity
T=2.3Q/4∏Δs
=2.3*172.8/(4*∏*0.8)
= 39.6 m^2/day (drawdown)

Hydraulic conductivity
K=T/b
= 39.6/6
= 6.6 m/day (drawdown)

Storativity
$S=2.25Tt_o/r^2$
$=2.25*39.6*0.006/40.8^2$
$=3.2x10^{-4}$ (drawdown)

(Observation bore)

Figure B.30: GW5C 21 day test analysis

(Observation bore)

Figure B.31: GW5D 21 day test analysis