— * lee.ameconsulting@gmail.com.

Appendix A1
Application for Subdivision of Land in Jack County, Texas

1. Name of Applicant: AME Consulting LLC.
2. Name of Subdivision: Mesquite Estates

FILED FOR RECORD
_____ O'CLOCK _____ M
JUN 27 2022
VANESSA JAMES, County Clerk
JACK COUNTY, TEXAS
BY _____ DEPUTY

3. Designated Contact Person for Applicant:
   a. Name: Lee Anderson
   b. Address: 401 advance Rd
   c. City/Zip: Weatherford Tx 76088
   d. Phone Number: 940 789-8604
4. Name of all Title Owner(s) of Property to be sub-divided:
   a. Name Brody K Rockey & Kassie A. Rockey
   b. Address: 251 Oak Ridge St
   c. City/Zip: Jacksboro Tx 76458
   d. Phone Number: Brody- 817-995-6748
      Kassie 682-554-1231
5. Jack County Appraisal District Tract or Parcel Identification Number for land to be developed: 54008 + 54063
6. County Commissioner Precinct in which land to be developed is located: Jack County #2
7. Location of Land to be Developed: 12.83 acres AB 489 T. Robbins Survey
   a. Legal or Mailing Address: O'Neal Lane Jacksboro Tx 76458
   b. 911 Address:
   c. Coordinates:
   d. Topo or other suitable map depicting entire area to be subdivided.

8. Certifications Required by Subdivision Regulations:
    a. 1. Application for Subdivision
       2. Application for Manufactured Home Rental Community
    b. Certificate of Fire Department
    c. 1. Certificate of Dedication by Owner/individual
       2. Certificate of Dedication by Owner/corporation
    d. Certificate of County Approval of Plat and Recording
    e. Certificate of Water/Wastewater Supply
    f. Certificate of Surveyor
    g. Certificate of Engineer
    h. Certificate of OSSF Inspector (if applicable)
    i. Certificate of Private Road maintenance
    j. Certificate that Subdivider seeks County Roads maintenance
    k. Certificate of County Taxes Paid
    l. Permit to Construct Driveway within County Road R-O-W
    m. Notice of Proposed Utility in R-O-W
    n. Plans and Specifictions for Cattleguard
    o. Typical Cross Section of Road
    p. Summary of Road Standards
    q. Lienholder Acknowledgment
    r. Application for RevisIons to Existing Plat
    s. Reciept for Required Fees:
    t. Required number of copies of plat, if required, are provided:

Appendix B

CERTIFICATE OF FIRE DEPARTMENT

THE STATE OF TEXAS §
§
COUNTY OF JACK §

I, Jason Jennings, an authorized agent of the Jack Co Rural fire department, have inspected the property described as the Mesquite subdivision of Jack County, Texas, and I do hereby certify that the subdivision as platted will satisfy the requirements of the Jack County Subdivision Regulation, specifically sections 2.2, 2.4.3 (d), 2.5(F), of said regulation, subject to final inspection as built upon the ground.

WITNESS MY HAND AND SEAL OF OFFICE this the 27th day of June, A.D., 2022.

_____
COUNTY CLERK
JACK COUNTY, TEXAS

Appendix C (2)

CERTIFICATE OF DEDICATION BY OWNER/SUBDIVIDER/developer
(When owner/subdivider/developer is a Corporation)

THE STATE OF TEXAS §
§
COUNTY OF JACK §

KNOW ALL MEN BY THESE PRESENT, that AME Consulting LLC, a corporation organized and existing under the laws of the State of Texas, with its home address at 2321 Erwin Rd Jacksboro TX 76458 and owner/subdivider/ or developer of 12.83 acres of land out of the AB 489 T Robbins Survey, in Jack County, Texas, as conveyed to it by deed dated 12/3/2015 and recorded in Volume 1000, Page 396, Real Property Records of Jack County, **DOES HEREBY SUBDIVIDE** 12.83 acres of land out of said Survey,

(Note: if the subdivision lies in more than one survey, determine the acreage in each survey and repeat for each original survey within the subdivision)

to be known as the Mesquite Estates Subdivision, in accordance with the plat shown hereon, subject to any and all easements or restrictions heretofore granted and does hereby dedicate to the public (or "owner/subdivider/developer of the property shown hereon" for private streets) the use of the streets and easements shown hereon.

IN WITNESS WHEREOF the said _____ has caused these present to be executed by its _____, thereunto duly authorized, this the 20 day of May, A.D., 2022.

LEE Anderson ATTEST: _____
(Name, Title) (Name, Title)

THE STATE OF TEXAS §
§
COUNTY OF JACK §

BEFORE ME, the undersigned authority, on this day personally appeared Paris Lee Anderson known to me to be the person whose name is subscribed to the foregoing instrument as an officer of AME Consulting LLC. and acknowledged to me that the foregoing was executed in such capacity as the act of said corporation for the purposes and considerations therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 23 day of May, A.D., 2022.

Leann Johnson
~~Notary~~ Public in and for the State of Texas

LEANN JOHNSON
Notary Public, State of Texas
My Commission Expires
October 01, 2023
NOTARY ID 13219361-4

FILED FOR RECORD
VANESSA JAMES - COUNTY CLERK
JACK COUNTY, TEXAS

INST NO:20240000013

FILED ON: OCTOBER 3, 2023 AT 10:27am
THE INSTRUMENT CONTAINED 2 PAGES AT FILING

THE STATE OF TEXAS
COUNTY OF JACK

I, Vanessa James, Clerk County Court in and for said county hereby do certify that the foregoing instrument was filed for record in my office on the 3rd day of October 2023 at10:27 AM and duly recorded on that date, in the Official Public Records of said county.

Instrument # 20240000013, 2 Pages

Vanessa James

Vanessa James, County Clerk

Appendix D

CERTIFICATE OF COUNTY APPROVAL OF PLAT AND RECORDING

THE STATE OF TEXAS §
§
COUNTY OF JACK §

I, Vanessa James, County Clerk of Jack County, Texas, do hereby certify that the foregoing instrument of writing with its certificate of authentication was filed for record in my office on the 28th day of June, 2022, at 8:47 o'clock a m., and duly recorded on the 28th day of June, A.D., 2022, at 8:47 o'clock a m., in the Real Property Records of Jack County, Texas in ~~Volume ____, Page ____~~. #20220002419

WITNESS MY HAND AND SEAL OF OFFICE this the 28th day of June, A.D., 2022.

Vanessa James
COUNTY CLERK
JACK COUNTY, TEXAS

Appendix E

CERTIFICATE OF WATER/WASTEWATER SUPPLY

"No structure in this subdivision shall be occupied until connected to either: an individual water well, the location of which has been approved by the any applicable regulation, or connected to a TCEQ approved public water supply system (described below), or other domestic water supply corporation, and subject to approval by the Jack County Commissioners Court."

_____ _____

Underground Water Conservation District — Date

_____ _____

Name of Public Water Supply System — Date

_____

Signature & Title of Authorized Agent

Other Proposed Domestic Water Supply (Please specify): Private Rural Water System

Appendix F

CERTIFICATE OF SURVEYOR

THE STATE OF TEXAS §
§
COUNTY OF JACK §

KNOW ALL MEN BY THESE PRESENT, that I, the undersigned, a Registered Professional / State Land Surveyor in the State of Texas, do hereby certify that this Plat complies with the survey related requirements of Texas law and of the Jack County Subdivision Regulations and I further certify that this plat is true and correctly made and is prepared from an actual survey of the property made under my supervision on the ground and that the corner monuments were properly placed under my supervision.

_____ _____

Registered Professional / State Land Surveyor Date

License No. _____

Seal:

See Plat for seal & certification

Appendix H

CERTIFICATE OF ON-SITE SEWAGE FACILITY INSPECTOR'S APPROVAL

THE STATE OF TEXAS §
§
COUNTY OF JACK §

KNOW ALL MEN BY THESE PRESENTS, that I, the undersigned, a Licensed On-Site Sewage Facility Inspector in the State of Texas, hereby certify that I have inspected the On-Site Sewage Facilities for this plat, and the same complies with the related requirements of the Jack County Subdivision Regulations and the TCEQ.

BJ Hammon
On Site Inspector

5-19-22
Date

License No. 36200

Seal:

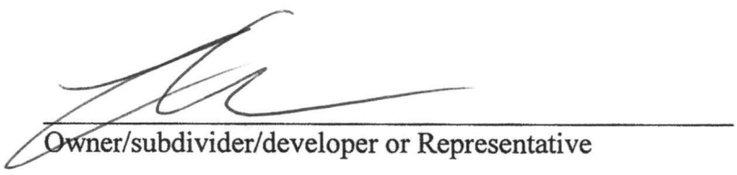
[NOTE: *The inspector may be required to be present for questioning at the presentation of the plat to the Commissioners Court.*]

Appendix I

CERTIFICATE OF ROAD MAINTENANCE

(When roads are to be maintained as Private Roads)

"In approving this plat by the Commissioners Court of Jack County, Texas, it is understood that all roads shown hereon are private roads and shall remain the property of the Owner/subdivider/developer and/or subsequent owners of the property. The construction, repair, and maintenance of these roads and any associated drainage improvements will be the responsibility of the Owner/subdivider/developer and/or subsequent owners of the subdivision and will not be the responsibility of Jack County."



Owner/subdivider/developer or Representative

5/20/2022

Date

Appendix K

CERTIFICATE OF COUNTY TAXES PAID

THE STATE OF TEXAS §
§
COUNTY OF JACK §

I, _____, County Tax Assessor/Collector, of Jack County, Texas, do hereby certify that on the _____ day of _____, A.D., 2_____, that no taxes owed to Jack County are currently due and owing on the following tracts of land:

Identify all tracts or parcels within proposed subdivision:

Parcel ID # 54008
Parcel ID# 54063

WITNESS MY HAND AND SEAL OF OFFICE this the _____ day of _____, A.D., 20_____.

_____

Gjack _____ **COUNTY CLERK**
JACK COUNTY, TEXAS

_____

_____, **COUNTY JUDGE**
JACK COUNTY, TEXAS

See Attached tax certificates

TAX CERTIFICATE

Please remit payment to:
Jack County Tax Office
Sharon Robinson, PCC, CTOP
100 N. Main Street, Ste 209
Jacksboro, TX 76458
Phone: (940)567-2352

Fee: 10.00
Certificate Number: 52918

I hereby certify that after checking the records of the Taxing Jurisdictions listed below, the following delinquent taxes, penalties and interest are due on the property described below, if paid by the last day of the month in which this certificate is issued.

Owner Interest: 1.000000
Owner: R973428
ROCKEY BRODY K & KASSIE A
PO BOX 790
JACKSBORO TX 76458

Parcel ID/Seq: 54063/1
Account #: 20489-00028-00402-000000
Legals: AB 489 T ROBBINS
1998 CLAYTON 28X60
REAL PROPERTY

Suit: No
Acres: 0.500
Land Value: $ 4780
Pers Value: $ 0
Imp Value: $ 30320
Ag/Timber: $ 0

Property Address: ONEAL LN
MH Label: HWC0279357
MH Serial: CSS001593TXA

Abst/Subdiv:
Block: Lot:

HS Code:
Cat Code: E2
MTG/Loan: -

Year	Entity	Value	Original Tax	Tax Due	Discount	Penalty/ Interest	Total Due
2021	01 - JACK COUNTY	35,100	$150.79	$0.00	$0.00	$0.00	$0.00
2021	31 - JACKSBORO I.S.D.	35,100	$338.15	$0.00	$0.00	$0.00	$0.00
2021	31IS - JISD ISD I&S	35,100	$161.46	$0.00	$0.00	$0.00	$0.00
2021	61 - JACK CO HOSPITAL DIST	35,100	$110.57	$0.00	$0.00	$0.00	$0.00
2021	63 - JACK CO WCID #1	35,100	$4.30	$0.00	$0.00	$0.00	$0.00
2021	65 - JACK COUNTY SPECIAL	35,100	$40.08	$0.00	$0.00	$0.00	$0.00
Totals:			$805.35	$0.00	$0.00	$0.00	**$0.00**
Parcel Total:			**$805.35**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

PAID HISTORY (CURRENT TAX YEAR) 2021

Jurisdiction	Tax	Discount	Penalty	Other Payment	Total Amount	Cod	Ref Number	Posting Date
01	$150.79	$0.00	0.00	$0.00	$150.79		1964	01/20/2022
31	$338.15	$0.00	0.00	$0.00	$338.15		1964	01/20/2022
31IS	$161.46	$0.00	0.00	$0.00	$161.46		1964	01/20/2022
61	$110.57	$0.00	0.00	$0.00	$110.57		1964	01/20/2022
63	$4.30	$0.00	0.00	$0.00	$4.30		1964	01/20/2022
65	$40.08	$0.00	0.00	$0.00	$40.08		1964	01/20/2022
	$805.35	**$0.00**	**$0.00**	**$0.00**	**$805.35**			

Signed By: Sharon Robinson
Date: 5-18-22

Issued By: Sharon Robinson

Issued To: AME Consulting LLC

Issued Date: 5/18/2022 3:01:39PM DPIYRMO: 202205

If the above described property has received special valuation based on its use, additional rollback taxes including penalty and interest, may become due based on the statutory provisions of the special valuation. Property omitted from the appraisal roll as described under Tax Code Section 25.21 is not included in this certificate [Tax Code Section 31.08(b)].

ASSESSOR & COLLECTOR OF TAXES
JACK COUNTY, TEXAS

TAX CERTIFICATE

Please remit payment to:
Jack County Tax Office
Sharon Robinson, PCC, CTOP
100 N. Main Street, Ste 209
Jacksboro, TX 76458
Phone: (940)567-2352

Fee: 10.00
Certificate Number: 52917

I hereby certify that after checking the records of the Taxing Jurisdictions listed below, the following delinquent taxes, penalties and interest are due on the property described below, if paid by the last day of the month in which this certificate is issued.

Owner Interest: 1.000000
Owner: R973428
ROCKEY BRODY K & KASSIE A
PO BOX 790
JACKSBORO TX 76458

Parcel ID/Seq: 54008/1
Account #: 20489-00028-00401-000000
Legals: AB 489 T ROBBINS

Suit: No
Acres: 12.330
Land Value: $ 48860
Pers Value: $ 0
Imp Value: $ 0
Ag/Timber: $ 890

Property Address: ONEAL LN
MH Label:
MH Serial:

Abst/Subdiv:
Block: Lot:

HS Code:
Cat Code: D1
MTG/Loan: -

Year	Entity	Value	Original Tax	Tax Due	Discount	Penalty/ Interest	Total Due
2021	01 - JACK COUNTY	890	$3.82	$0.00	$0.00	$0.00	$0.00
2021	31 - JACKSBORO I.S.D.	890	$8.57	$0.00	$0.00	$0.00	$0.00
2021	31IS - JISD ISD I&S	890	$4.09	$0.00	$0.00	$0.00	$0.00
2021	61 - JACK CO HOSPITAL DIST	890	$2.80	$0.00	$0.00	$0.00	$0.00
2021	63 - JACK CO WCID #1	890	$0.11	$0.00	$0.00	$0.00	$0.00
2021	65 - JACK COUNTY SPECIAL	890	$1.02	$0.00	$0.00	$0.00	$0.00
Totals:			$20.41	$0.00	$0.00	$0.00	**$0.00**
Parcel Total:			**$20.41**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

PAID HISTORY (CURRENT TAX YEAR) 2021

Jurisdiction	Tax	Discount	Penalty	Other Payment	Total Amount	Cod	Ref Number	Posting Date
01	$3.82	$0.00	0.00	$0.00	$3.82		1964	01/20/2022
31	$8.57	$0.00	0.00	$0.00	$8.57		1964	01/20/2022
31IS	$4.09	$0.00	0.00	$0.00	$4.09		1964	01/20/2022
61	$2.80	$0.00	0.00	$0.00	$2.80		1964	01/20/2022
63	$0.11	$0.00	0.00	$0.00	$0.11		1964	01/20/2022
65	$1.02	$0.00	0.00	$0.00	$1.02		1964	01/20/2022
	$20.41	**$0.00**	**$0.00**	**$0.00**	**$20.41**			

Signed By: Sharon Robinson
Date: 5-18-22

Issued By: Sharon Robinson

Issued To: AME Consulting LLC

Issued Date: 5/18/2022 3:01:00PM DPIYRMO: 202205

If the above described property has received special valuation based on its use, additional rollback taxes including penalty and interest, may become due based on the statutory provisions of the special valuation. Property omitted from the appraisal roll as described under Tax Code Section 25.21 is not included in this certificate [Tax Code Section 31.08(b)].

ASSESSOR & COLLECTOR OF TAXES
JACK COUNTY, TEXAS

Appendix S
Development Fees and Receipt

The following are a list of development fees for Jack County. These fees are subject to change.

Plat without a designated floodplain: $2000.00 + $10.00 per lot

Plat in a designated floodplain: $2500.00 + $10.00 per lot

Final Plat: $250.00

Total Development Fees due with Application: $ 2120.00
Inspection Fees pursuant to Section 2.8.4 $ _____
Total Fees due: $ 2120.00

Receipt of Development and Inspection Fees:

On this date, the sum of $ 2120.00 was received and receipt given by the Treasurer of Jack County.

_____
Jack County Treasurer

Mesquite Estates

AME Consulting LLC

Lee Anderson

RECEIVED

MAY 20 2022

By

May 13, 2022

Plat Deficiencies:

1) Groundwater Availability Study
2) Notes required on Plat – (14 pt)
    a. Approval of Plat streets pg 33
    b. Jack County representation water – pg 31
    c. Jack County shall not repair – pg 41
    d. Not within 100 years flood
3) Appendix Required
    a. Appendix B
    b. Appendix C(2)
    c. Appendix D
    d. Appendix E
    e. Appendix F
    f. Appendix H
    g. Appendix I or J
    h. Appendix K
    i. Appendix S

Erwin
WATER WELL DRILLING, LLC

6991 FM 4
Jacksboro, TX 76458
(940) 567-5708
info@erwindrilling.com

To Whom it May Concern:

Erwin Water Well has completed a review of available groundwater for the proposed subdivision located on O'Neal Ln in Jacksboro, TX. Publicly available driller's reports for the adjacent properties, along with knowledge of the area indicate that there would be an adequate amount of usable groundwater to support this residential project. Per TCEQ rule 290.45 "Minimum Water System Capacity Requirements", a community public water supply system with less than 50 connections is required to have 0.6 gallons per minute per connection available from groundwater. Based on this guideline the 11 residences would be supported by 7 gallons per minute. According to our records the existing well has a capacity of 15 gallons per minute. The combined capacity of the existing and proposed wells is expected to be 30 gallons per minute. With a system capacity 4 times greater than the required minimum we believe the proposed system would perform adequately to support the project for domestic use without significantly stressing the aquifer and impacting nearby properties. However, there is always uncertainty involved in water well drilling and Erwin Water Well is not responsible for the quality and/or quantity of water.

Regards,

Bryan Erwin

Bryan Erwin
TDLR Water Well Driller's License No: 60445

GROUNDWATER AVAILABILITY CERTIFICATION FOR PLATTING
§§230.1 - 230.11
Effective July 31, 2008

§230.1. Applicability.

(a) Subdivisions utilizing groundwater as the source of water supply. In the plat application and approval process, municipal and county authorities may require certification that adequate groundwater is available for a proposed subdivision if groundwater under that land is to be the source of water supply. The municipal or county authority is not required to exercise their authority under Texas Local Government Code, §212.0101 or §232.0032. However, if they do exercise their authority, the form and content of this chapter must be used.

(b) Use of this chapter. If required by the municipal or county authority, the plat applicant and the Texas licensed professional engineer or the Texas licensed professional geoscientist shall use this chapter and the attached form to certify that adequate groundwater is available under the land of a subdivision subject to platting under Texas Local Government Code, §212.004 and §232.001. These rules do not replace other state and federal requirements applicable to public drinking water supply systems. These rules do not replace the authority of counties within designated priority groundwater management areas under Texas Water Code, §35.019, or the authority of groundwater conservation districts under Texas Water Code, Chapter 36.

(c) Transmittal of data. If use of this chapter is required by the municipal or county authority, the plat applicant shall:

(1) provide copies of the information, estimates, data, calculations, determinations, statements, and certification required by §230.8 of this title (relating to Obtaining Site-Specific Groundwater Data), §230.9 of this title (relating to Determination of Groundwater Quality), §230.10 of this title (relating to Determination of Groundwater Availability), and §230.11 of this title (relating to Groundwater Availability and Usability Statements and Certification) to the executive administrator of the Texas Water Development Board and to the applicable groundwater conservation district or districts; and

(2) using the attached form, attest that copies of the information, estimates, data, calculations, determinations, statements, and the certification have been provided to the executive administrator of the Texas Water Development Board and the applicable groundwater conservation district or districts. The executive director may make minor changes to this form that do not conflict with the requirements of these rules.

TRANSMITTAL OF DATA
Use of this form: If required by a municipal authority pursuant to Texas Local Government Code, §212.0101, or a county authority pursuant to Texas Local Government Code, §232.0032 the plat applicant shall use this form to attest that information has been provided in accordance with the requirements of Title 30, TAC, Chapter 230. This form shall be provided to the municipal or county authority, the executive administrator of the Texas Water Development Board, and the applicable groundwater conservation district or districts.

Name of Proposed Subdivision: Mesquite Estates

Property Owner's Name(s): Brody and Kassie Rockey
Address: PO Box 790, Jacksboro, TX 76458
Phone: 817-995-6748
Fax:

Plat Applicant's Name: AME Consulting, LLC (Lee Anderson)
Address: 401 Advance Road. Weatherford. TX 76088
Phone: 940-229-8606
Fax:

I, Lee Anderson, the Plat Applicant, attest that the following information has been provided in accordance with Title 30, TAC, Chapter 230.

Has the Certification of Groundwater Availability for Platting Form (Figure: 30 TAC §230.3(c)) been provided to the:	(Please Circle One)	
1. Municipal or County authority?	(Yes)	No
2. Executive administrator of the Texas Water Development Board?	(Yes)	No
3. Applicable Groundwater Conservation District or Districts?	Yes	(No)
Name of Groundwater Conservation District or Districts:		
N/A		
Have copies of the information, estimates, data, calculations, determinations, and statements been provided to the:		
4. Executive administrator of the Texas Water Development Board?	(Yes)	No
5. Applicable Groundwater Conservation District or Districts?	Yes	(No)
Name of Groundwater Conservation District or Districts:		
N/A		

Note: Mail the required information to the executive administrator of the Texas Water Development Board at the following address:

Executive Administrator
Texas Water Development Board
Groundwater Resources Division
P.O. Box 13231
Austin, Texas 78711-3231

Contact and other information for the Groundwater Conservation Districts within the state may be accessed on the following Internet pages:

http://www.tceq.state.tx.us/permitting/water_supply/groundwater/districts.html
http://www.twdb.state.tx.us/GwRD/pages/gwrdindex.html
http://www.texasgroundwater.org/index.htm

Adopted July 9, 2008 Effective July 31, 2008

§230.2. Definitions.

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise. If a word or term used in this chapter is not contained in this section, it shall have the same definition and meaning as used in the practices applicable to hydrology and aquifer testing.

(1) **Applicable groundwater conservation district or districts**--Any district or authority created under Texas Constitution, Article III, Section 52, or Article XVI, Section 59, that:

(A) has the authority to regulate the spacing of water wells, the production from water wells, or both, and

(B) which includes within its boundary any part of the plat applicant's proposed subdivision.

(2) **Aquifer**--A geologic formation, group of formations, or part of a formation that contains water in its voids or pores and may be used as a source of water supply.

(3) **Aquifer test**--A test involving the withdrawal of measured quantities of water from or addition of water to a well and the measurement of resulting changes in water level in the aquifer both during and after the period of discharge or addition for the purpose of determining the characteristics of the aquifer. For the purposes of this chapter, bail and slug tests are not considered to be aquifer tests.

(4) **Certification**--A written statement of best professional judgement or opinion as attested to on the Certification of Groundwater Availability for Platting Form contained under §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting).

(5) **Drinking water standards**--As defined in commission rules covering drinking water standards contained in Chapter 290, Subchapter F of this title (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems).

(6) **Executive administrator**--The executive administrator of the Texas Water Development Board.

(7) **Full build out**--The final expected number of residences, businesses, or other dwellings in the proposed subdivision.

(8) **Licensed professional engineer**--An engineer who maintains a current license through the Texas Board of Professional Engineers in accordance with its requirements for professional practice.

(9) **Licensed professional geoscientist**--A geoscientist who maintains a current license through the Texas Board of Professional Geoscientists in accordance with its requirements for professional practice.

(10) **Plat applicant**--The owner or the authorized representative or agent seeking approval of a proposed subdivision plat application pursuant to municipal or county authority.

(11) **Requirements applicable to public drinking water supply systems**--The requirements contained in commission rules covering public drinking water supply systems in Chapter 290, Subchapter D of this title (relating to Rules and Regulations for Public Water Systems).

Adopted July 9, 2008 Effective July 31, 2008

§230.3. Certification of Groundwater Availability for Platting.

(a) Certification. The certification required by this chapter must be prepared by a Texas licensed professional engineer or a Texas licensed professional geoscientist.

(b) Submission of information. The plat applicant shall provide to the municipal or county authority, the executive administrator of the Texas Water Development Board, and the applicable groundwater conservation district or districts the certification of adequacy of groundwater under the subdivision required by this chapter.

(c) Form required. This chapter and the following form shall be used and completed if plat applicants are required by the municipal or county authority to certify that adequate groundwater is available under the land to be subdivided. The executive director may make minor changes to this form that do not conflict with the requirements of these rules.

CERTIFICATION OF GROUNDWATER AVAILABILITY FOR PLATTING FORM

Use of this form: If required by a municipal authority pursuant to Texas Local Government Code, §212.0101, or a county authority pursuant to §232.0032, Texas Local Government Code, the plat applicant and the Texas licensed professional engineer or Texas licensed professional geoscientist shall use this form based upon the requirements of Title 30, TAC, Chapter 230 to certify that adequate groundwater is available under the land to be subdivided (if the source of water for the subdivision is groundwater under the subdivision) for any subdivision subject to platting under Texas Local Government Code, §212.004 and §232.001.The form and Chapter 230 do not replace state requirements applicable to public drinking water supply systems or the authority of counties or groundwater conservation districts under either Texas Water Code, §35.019 or Chapter 36.

Administrative Information (30 TAC §230.4)
1. Name of Proposed Subdivision: Mesquite Estates

2. Any Previous Name Which Identifies the Tract of Land:
3. Property Owner's Name(s): Brody and Kassie Rockey
Address: PO Box 790, Jacksboro, TX 76458
Phone: 817-995-6748
Fax:
4. Plat Applicant's Name: AME Consulting, LLC (Lee Anderson)
Address: 401 Advance Road, Weatherford, TX 76088
Phone: 940-229-8606
Fax:
5. Licensed Professional Engineer or Geoscientist: AKV Engineering, LLC
Name: Bryan Erwin
Address: 6991 Fm 4, Jacksboro, TX 76458
Phone: 940-567-5708
Fax:
Certificate Number: TX PE 109851
6. Location and Property Description of Proposed Subdivision: AB 489 T Robbins
7. Tax Assessor Parcel Number(s).
Book:
Map:
Parcel: 54008

Proposed Subdivision Information (30 TAC §230.5)
8. Purpose of Proposed Subdivision (single family/multi-family residential, non-residential, commercial): Single family residential
9. Size of Proposed Subdivision (acres): 12.85
10. Number of Proposed Lots: 11
11. Average Size of Proposed Lots (acres): 1.05
12. Anticipated Method of Water Distribution. Public water supply wells (2)

Expansion of Existing Public Water Supply System?	Yes	(No)
New (Proposed) Public Water Supply System?	(Yes)	No
Individual Water Wells to Serve Individual Lots?	(Yes)	No
Combination of Methods?	Yes	(No)
Description (if needed):		

13. Additional Information (if required by the municipal or county authority):

Note: If public water supply system is anticipated, written application for service to existing water providers within a 1/2-mile radius should be attached to this form (30 TAC §230.5(f) of this title).

Projected Water Demand Estimate (30 TAC §230.6)
14. Residential Water Demand Estimate at Full Build Out (includes both single family and multi-family residential).
Number of Proposed Housing Units (single and multi-family): 11
Average Number of Persons per Housing Unit: 4
Gallons of Water Required per Person per Day: 75
Water Demand per Housing Unit per Year (acre feet/year): 0.4
Total Expected Residential Water Demand per Year (acre feet/year): 4.4
15. Non-residential Water Demand Estimate at Full Build Out.
Type(s) of Non-residential Water Uses: Small animal and hand watering only.
Water Demand per Type per Year (acre feet/year): 4.4
16. Total Water Demand Estimate at Full Build Out (acre feet/year): 8.8
17. Sources of Information Used for Demand Estimates: Chapter 3: Population & Water Demand Projections for DFW

General Groundwater Resource Information (30 TAC §230.7)

18. Identify and describe, using Texas Water Development Board names, the aquifer(s) which underlies the proposed subdivision:

The minor aquifer called the Cross Timbers underlies this subdivision and is generally comprised of Paleozoic-age water-bearing formations. Most producing wells in the area are believed to be in the Canyon formation which is composed of limestones with shales and sandstone layers.

Note: Users may refer to the most recent State Water Plan to obtain general information pertaining to the state's aquifers. The State Water Plan is available on the Texas Water Development Board's Internet website at: www.twdb.state.tx.us

Obtaining Site-Specific Groundwater Data (30 TAC §230.8)		
19. Have all known existing, abandoned, and inoperative wells within the proposed subdivision been located, identified, and shown on the plat as required under §230.8(b) of this title?	(Yes)	No
20. Were the geologic and groundwater resource factors identified under §230.7(b) of this title considered in planning and designing the aquifer test required under §230.8(c) of this title?	(Yes)	No ( )
21. Have test and observation wells been located, drilled, logged, completed, developed, and shown on the plat as required by §230.8(c)(1) - (4) of this title?	(Yes)	No
22. Have all reasonable precautions been taken to ensure that contaminants do not reach the subsurface environment and that undesirable groundwater has been confined to the zone(s) of origin (§230.8(c)(5) of this title)?	(Yes)	No
23. Has an aquifer test been conducted which meets the requirements of §230.8(c)(1) and (6) of this title?	(Yes)	No
24. Were existing wells or previous aquifer test data used?	(Yes)	No
25. If yes, did they meet the requirements of §230.8(c)(7) of this title?	(Yes)	No
26. Were additional observation wells or aquifer testing utilized?	Yes	(No)

Note: If expansion of an existing public water supply system or a new public water supply system is the anticipated method of water distribution for the proposed subdivision, site-specific groundwater data shall be developed under the requirements of 30 TAC, Chapter 290, Subchapter D of this title (relating to Rules and Regulations for Public Water Systems) and the applicable information and correspondence developed in meeting those requirements shall be attached to this form pursuant to §230.8(a) of this title.

Determination of Groundwater Quality (30 TAC §230.9)		
27. Have water quality samples been collected as required by §230.9 of this title?	(Yes)	No
28. Has a water quality analysis been performed which meets the requirements of §230.9 of this title?	(Yes)	No

Determination of Groundwater Availability (30 TAC §230.10)		
29. Have the aquifer parameters required by §230.10(c) of this title been determined?	(Yes)	No
30. If so, provide the aquifer parameters as determined.		
Rate of yield and drawdown: 15 gpm @ 80 ft		
Specific capacity: 0.19 gpm/ft		
Efficiency of the pumped well: >99%		
Transmissivity: 569.6 gal/day/ft		
Coefficient of storage: 6.9 E-09		
Hydraulic conductivity: 10.95 ft/day		
Were any recharge or barrier boundaries detected?	Yes	(No)
If yes, please describe:		
Thickness of aquifer(s): 52 ft		
31. Have time-drawdown determinations been calculated as required under §230.10(d)(1) of this title?	(Yes)	No
32. Have distance-drawdown determinations been calculated as required under §230.10(d)(2) of this title?	(Yes)	No
33. Have well interference determinations been made as required under §230.10(d)(3) of this title?	(Yes)	No
34. Has the anticipated method of water delivery, the annual groundwater demand estimates at full build out, and geologic and groundwater information been taken into account in making these determinations?	(Yes)	No
35. Has the water quality analysis required under §230.9 of this title been compared to primary and secondary public drinking water standards as required under §230.10(e) of	(Yes)	No

this title?		
Does the concentration of any analyzed constituent exceed the standards?	(Yes)	No
If yes, please list the constituent(s) and concentration measure(s) which exceed standards: TDS 1280 ppm		

Groundwater Availability and Usability Statements (30 TAC §230.11(a) and (b))
36. Drawdown of the aquifer at the pumped well(s) is estimated to be 8.93 feet over a 10-year period and 9.19 feet over a 30-year period.
37. Drawdown of the aquifer at the property boundary is estimated to be 5.41 feet over a 10-year period and 5.66 feet over a 30-year period.
38. The distance from the pumped well(s) to the outer edges of the cone(s)-of-depression is estimated to be 5,000 feet over a 10-year period and 8,000 feet over a 30-year period.
39. The recommended minimum spacing limit between wells is 200 feet with a recommended well yield of 15 gallons per minute per well.
40. Available groundwater is / is not (circle one) of sufficient quality to meet the intended use of the platted subdivision.
41. The groundwater availability determination does not consider the following conditions (identify any assumptions or uncertainties that are inherent in the groundwater availability determination):

Certification of Groundwater Availability (30 TAC §230.11(c)) Must be signed by a Texas Licensed Professional Engineer or a Texas Licensed Professional Geoscientist.
42. I, Bryan Erwin, Texas Licensed Professional Engineer or Texas Licensed Professional Geoscientist (circle which applies), certificate number TX PE 109851, based on best professional judgment, current groundwater conditions, and the information developed and presented in this form, certify that adequate groundwater is available from the underlying aquifer(s) to supply the anticipated use of the proposed subdivision.

Date: (affix seal)

Bryan Erwin
6/8/2022

Adopted July 9, 2008 Effective July 31, 2008

§230.4. Administrative Information.

At a minimum, the following general administrative information as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting), shall be provided for a proposed subdivision for which groundwater under the land will be the source of water supply:

(1) the name of the proposed subdivision;

(2) any previous or other name(s) which identifies the tract of land;

(3) the name, address, phone number, and facsimile number of the property owner or owners;

(4) the name, address, phone number, and facsimile number of the person submitting the plat application;

(5) the name, address, phone number, facsimile number, and registration number of the licensed professional engineer or the licensed professional geoscientist preparing the certification as required in this chapter;

(6) the location and property description of the proposed subdivision; and

(7) the tax assessor parcel number(s) by book, map, and parcel.

Adopted January 23, 2003 Effective February 13, 2003

§230.5. Proposed Subdivision Information.

At a minimum, the following information pertaining to the proposed subdivision shall be provided as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting):

(1) the purpose of the proposed subdivision, for example, single family residential, multi-family residential, non-residential, commercial, or industrial;

(2) the size of the proposed subdivision in acres;

(3) the number of proposed lots within the proposed subdivision;

(4) the average size (in acres) of the proposed lots in the proposed subdivision;

(5) the anticipated method of water distribution to the proposed lots in the proposed subdivision including, but not limited to:

(A) an expansion of an existing public water supply system to serve the proposed subdivision (if groundwater under the subdivision is to be the source of water supply);

(B) a new public water supply system for the proposed subdivision;

(C) individual water wells to serve individual lots; or

(D) a combination of methods;

(6) if the anticipated method of water distribution for the proposed subdivision is from an expansion of an existing public water supply system or from a proposed public water supply system, evidence required under §290.39(c)(1) of this title (relating to Rules and Regulations for Public Water Systems) which shall be provided demonstrating that written application for service was made to the existing water providers within a ½-mile radius of the subdivision; and

(7) any additional information required by the municipal or county authority as part of the plat application.

Adopted June 14, 2000 Effective July 9, 2000

§230.6. Projected Water Demand Estimate.

(a) Residential water demand estimate. Residential water demand estimates at full build out shall be provided as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting). Residential demand estimates shall, at a minimum, be based on the current demand of any existing residential well including those identified under §230.8(b) of this title (relating to Obtaining Site-Specific Groundwater Data), or §290.41(c) of this title (relating to Rules and Regulations for Public Water Systems), and:

(1) the number of proposed housing units at full build out;

(2) the average number of persons per housing unit;

(3) the gallons of water required per person per day;

(4) the water demand per housing unit per year (acre feet per year); and

(5) the total expected residential water demand per year for the proposed subdivision (acre feet per year).

(b) Non-residential water demand estimate. Water demand estimates at full build out shall be provided for all non-residential uses as specified in §230.3(c) of this title. Non-residential uses shall be specified by type of use and groundwater demand per year (acre feet per year) for each type of use. The estimate shall also include the existing non-residential demand of any well including those identified under §230.8(b) of this title or §290.41(c) of this title.

(c) Total annual water demand estimate. An estimate of the total expected annual groundwater demand, including residential and non-residential estimates at full build out (acre feet per year), shall be provided as specified in §230.3(c) of this title.

(d) Submission of information. The sources of information used and calculations performed to determine the groundwater demand estimates as required by this section shall be made available to the municipal or county authority if requested. The plat applicant shall provide any additional groundwater demand information required by the municipal or county authority as part of the plat application.

Adopted June 14, 2000 Effective July 9, 2000

§230.7. General Groundwater Resource Information.

(a) Aquifer identification. Using Texas Water Development Board aquifer names, the aquifer(s) underlying the proposed subdivision which is planned to be used as the source of water for the subdivision shall be identified and generally described as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting).

(b) Geologic and groundwater information. To meet the requirements of this chapter, the following geologic and groundwater information shall be considered in planning and designing the aquifer test under §230.8(c) of this title (relating to Obtaining Site-Specific Groundwater Data):

(1) the stratigraphy of the geologic formations underlying the subdivision;

(2) the lithology of the geologic strata;

(3) the geologic structure;

(4) the characteristics of the aquifer(s) and their hydraulic relationships;

(5) the recharge to the aquifer(s), and movement and discharge of groundwater from the aquifer(s); and

(6) the ambient quality of water in the aquifer(s).

Adopted June 14, 2000 Effective July 9, 2000

§230.8. Obtaining Site-Specific Groundwater Data.

(a) Applicability of section. This section is applicable only if the proposed method of water distribution for the proposed subdivision is individual water wells on individual lots. If expansion of an existing public water supply system or installation of a new public water supply system is the proposed method of water distribution for the proposed subdivision, site-specific groundwater data shall be developed under the requirements of Chapter 290, Subchapter D of this title (relating to Rules and Regulations for Public Water Systems) and the information developed in meeting these requirements shall be attached to the form required under §230.3 of this title (relating to Certification of Groundwater Availability for Platting).

(b) Location of existing wells. All known existing, abandoned, and inoperative wells within the proposed subdivision shall be identified, located, and mapped by on-site surveys. Existing well locations shall be illustrated on the plat required by the municipal or county authority.

(c) Aquifer testing. Utilizing the information considered under §230.7(b) of this title (relating to General Groundwater Resource Information), an aquifer test shall be conducted to characterize the aquifer(s) underlying the proposed subdivision. The aquifer test must provide sufficient information to allow evaluation of each aquifer that is being considered as a source of residential and non-residential water supply for the proposed subdivision. Appropriate aquifer testing shall be based on typical well completions. An aquifer test conducted under this section utilizing established methods shall be reported as specified in §230.3(c) of this title and shall include, but not be limited to, the following items.

(1) Test well and observation well(s). At a minimum, one test well (i.e., pumping well) and one observation well, shall be required to conduct an adequate aquifer test under this section. Additional observation wells shall be used for the aquifer test if it is practical or necessary to confirm the results of the test. The observation well(s) shall be completed in the same aquifer or aquifer production zone as the test well. The locations of the test and observation well(s) shall be shown on the plat required by the municipal or county authority.

(2) Location of wells. The test and observation well(s) must be placed within the proposed subdivision and shall be located by latitude and longitude. The observation well(s) shall be located at a radial distance such that the time-drawdown data collected during the planned pumping period fall on a type curve of unique curvature. In general, observation wells in unconfined aquifers should be placed no farther than 300 feet from the test well, and no farther than 700 feet in thick, confined aquifers. The observation well should also be placed no closer to the test well than two times the thickness of the aquifer's production zone. The optimal location for the observation well(s) can be determined by best professional judgement after completion and evaluation of the test well as provided in paragraph (4) of this subsection.

(3) Lithologic and geophysical logs. The test and observation wells shall be lithologically and geophysically logged to map and characterize the geologic formation(s) and the aquifer(s) in which the aquifer test(s) is to be performed.

(A) A lithologic log shall be prepared showing the depth of the strata, their thickness and lithology (including size, range, and shape of constituent particles as well as smoothness), occurrence of water bearing strata, and any other special notes that are relevant to the drilling process and to the understanding of subsurface conditions.

(B) Geophysical logs shall be prepared which provide qualitative information on aquifer characteristics and groundwater quality. At a minimum, the geophysical logs shall include an electrical log with shallow and deep-investigative curves (e.g., 16-inch short normal/64-inch long normal resistivity curves or induction log) with a spontaneous potential curve.

(C) The municipal or county authority may, on a case-by-case basis, waive the requirement of geophysical logs as required under this section if it can be adequately demonstrated that the logs are not necessary to characterize the aquifer(s) for testing purposes.

(4) Well development and performance. The test and observation well(s) shall be developed prior to conducting the aquifer test to repair damage done to the aquifer(s) during the drilling operation. Development shall insure that the hydraulic properties of the aquifer(s) are restored as much as practical to their natural state.

(A) Well development procedures applied to the well(s) may vary depending on the drilling method used and the extent of the damage done to the aquifer(s).

(B) During well development, the test well shall be pumped for several hours to determine the specific capacity of the well, the maximum anticipated drawdown, the volume of water produced at certain pump speeds and drawdown, and to determine if the observation well(s) are suitably located to provide useful data.

(C) Water pumped out of the well during well development shall not be allowed to influence initial well performance results.

(D) Aquifer testing required by this section shall be performed before any acidization or other flow-capacity enhancement procedures are applied to the test well.

(5) Protection of groundwater. All reasonably necessary precautions shall be taken during construction of test and observation wells to ensure that surface contaminants do not reach the subsurface environment and that undesirable groundwater (water that is injurious to human health and the environment or water that can cause pollution to land or other waters) if encountered, is sealed off and confined to the zone(s) of origin.

(6) Duration of aquifer test and recovery. The duration of the aquifer test depends entirely on local and geologic conditions. However, the test shall be of sufficient duration to observe a straight-line trend on a plot of water level versus the logarithm of time pumped. Water pumped during the test shall not be allowed to influence the test results. Aquifer testing shall not commence until water

levels (after well development) have completely recovered to their pre-development level or at least to 90% of that level.

(A) At a minimum, a 24-hour uniform rate aquifer test shall be conducted. Testing shall continue long enough to observe a straight-line trend on a plot of water level versus the logarithm of time pumped. If necessary, the duration of the test should be extended beyond the 24-hour minimum limit until the straight-line trend is observed.

(i) If it is impractical to continue the test until a straight-line trend of water level versus the logarithm of time pumped is observed within the 24-hour limit, the test shall continue at least until a consistent pumping-level trend is observed. In such instances, failure to observe the straight-line trend shall be recorded.

(ii) If the pumping rates remain constant for a period of at least four hours and a straight-line trend is observed on a plot of water level versus the logarithm of time pumped before the 24-hour limit has been reached, the pumping portion of the test may be terminated.

(iii) The frequency of water level measurements during the aquifer test shall be such that adequate definition of the time-drawdown curve is made available. As much information as possible shall be obtained in the first ten minutes of testing (i.e., pumping).

(B) Water-level recovery data shall be obtained to verify the accuracy of the data obtained during the pumping portion of the test. Recovery measurements shall be initiated immediately at the conclusion of the pumping portion of the aquifer test and shall be recorded with the same frequency as those taken during the pumping portion of the aquifer test. Time-recovery measurements shall continue until the water levels have recovered to pre-pumping levels or at least to 90% of that level. If such recovery is not possible, time-recovery measurements should continue until a consistent trend of recovery is observed.

(7) Use of existing wells and aquifer test data.

(A) An existing well may be utilized as an observation well under this section if sufficient information is available for that well to demonstrate that it meets the requirements of this section.

(B) The municipal or county authority may accept the results of a previous aquifer test in lieu of a new test if:

(i) the previous test was performed on a well located within a 1/4-mile radius of the subdivision;

(ii) the previous test fully meets all the requirements of this section;

(iii) the previous test was conducted on an aquifer which is being considered as a source of water supply for the proposed subdivision; and

(iv) aquifer conditions (e.g., water levels, gradients, etc.) during the previous test were approximately the same as they are presently.

(8) Need for additional aquifer testing and observation wells. Best professional judgement shall be used to determine if additional observation wells or aquifer tests are needed to adequately demonstrate groundwater availability. The Theis and Cooper-Jacob nonequilibrium equations, and acceptable modifications thereof, are based on well documented assumptions. To determine if additional information is needed, best professional judgement shall be used to consider these assumptions, the site-specific information derived from the aquifer test required by this section, the size of the proposed subdivision, and the proposed method of water delivery.

(d) Submission of information. The information, data, and calculations required by this section shall be made available to the municipal or county authority, if requested, to document the requirements of this section as part of the plat application.

Adopted June 14, 2000 Effective July 9, 2000

§230.9. Determination of Groundwater Quality.

(a) Water quality analysis. Water samples shall be collected near the end of the aquifer test for chemical analysis. Samples shall be collected from each aquifer being considered for water supply for the proposed subdivision and reported as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting).

(1) For proposed subdivisions where the anticipated method of water delivery is from an expansion of an existing public water supply system or a new public water supply system, the samples shall be submitted for bacterial and chemical analysis as required by Chapter 290, Subchapter F of this title (relating to Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements For Public Water Systems).

(2) For proposed subdivisions where the anticipated method of water delivery is from individual water supply wells on individual lots, samples shall be analyzed for the following:

(A) chloride;

(B) conductivity;

(C) fluoride;

(D) iron;

(E) nitrate (as nitrogen);

(F) manganese;

(G) pH;

(H) sulfate;

(I) total hardness;

(J) total dissolved solids; and

(K) presence/absence of total coliform bacteria.

(3) Conductivity and pH values may be measured in the field, and the other constituents shall be analyzed in a laboratory accredited by the agency according to Chapter 25, Subchapters A and B of this title (relating to General Provisions and Environmental Testing Laboratory Accreditation, respectively) or certified by the agency according to Chapter 25, Subchapters A and C of this title (relating to General Provisions and Environmental Testing Laboratory Certification, respectively).

(b) Submission of information. The information, data, and calculations required by this section shall be made available to the municipal or county authority, if requested, to document the requirements of this section as part of the plat application.

Adopted July 9, 2008 Effective July 31, 2008

§230.10. Determination of Groundwater Availability.

(a) Time frame for determination of groundwater availability. At a minimum, both a short- and long-term determination of groundwater availability shall be made, each considering the estimated total water demand at full build out of the proposed subdivision. Groundwater availability shall be determined for ten years and 30 years and for any other time frame(s) required by the municipal or county authority.

(b) Other considerations in groundwater availability determination. Groundwater availability determinations shall take into account the anticipated method of water delivery as identified under §230.5 of this title (relating to Proposed Subdivision Information) and will be compared to annual demand estimates at full build out as determined under §230.6 of this title (relating to Projected Water Demand Estimate).

(c) Determination of aquifer parameters. The parameters of the aquifer(s) being considered to supply water to the proposed subdivision shall be determined utilizing the information considered under §230.7 of this title (relating to General Groundwater Resource Information) and data obtained during the aquifer test required under §230.8 of this title (relating to Obtaining Site-Specific Groundwater Data) for individual water wells or under Chapter 290, Subchapter D of this title (relating to Rules and Regulations for Public Water Systems) and reported as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting). The time-drawdown and time-recovery data obtained during the aquifer test shall be used to determine aquifer parameters utilizing the nonequilibrium equations developed by Theis or Cooper-Jacob, or acceptable modifications thereof. The following aquifer parameters shall be determined:

(1) rate of yield and drawdown;

(2) specific capacity;

(3) efficiency of the pumped (test) well;

(4) transmissivity;

(5) coefficient of storage;

(6) hydraulic conductivity;

(7) recharge or barrier boundaries, if any are present; and

(8) thickness of the aquifer(s).

(d) Determination of groundwater availability. Using the information and data identified and determined in subsections (b) and (c) of this section, the following calculations shall be made.

(1) Time-drawdown. The amount of drawdown at the pumped well(s) and at the boundaries of the proposed subdivision shall be determined for the time frames identified under subsection (a) of this section.

(2) Distance-drawdown. The distance(s) from the pumped well(s) to the outer edges of the cone(s)-of-depression shall be determined for the time frames identified under subsection (a) of this section.

(3) Well interference. For multiple wells in a proposed subdivision, calculations shall be made to:

(A) determine how pumpage from multiple wells will affect drawdown in individual wells for the time frames identified under subsection (a) of this section; and

(B) determine a recommended minimum spacing limit between individual wells and well yields from the wells that will allow for the continued use of the wells for the time frames identified under subsection (a) of this section.

(e) Determination of groundwater quality. The water quality analysis required under §230.9 of this title (relating to Determination of Groundwater Quality) shall be compared to primary and secondary public drinking water standards and the findings documented as specified in §230.3(c) of this title.

(f) Submission of information. The information, data, and calculations required by this section shall be made available to the municipal or county authority, if required, to document the requirements of this section as part of the plat application.

Adopted June 14, 2000 Effective July 9, 2000

§230.11. Groundwater Availability and Usability Statements and Certification.

(a) Groundwater availability and usability statements. Based on the information developed under §230.10 of this title (relating to Determination of Groundwater Availability), the following information shall be provided as specified in §230.3(c) of this title (relating to Certification of Groundwater Availability for Platting):

(1) the estimated drawdown of the aquifer at the pumped well(s) over a ten-year period and over a 30-year period;

(2) the estimated drawdown of the aquifer at the subdivision boundary over a ten-year period and over a 30-year period;

(3) the estimated distance from the pumped well(s) to the outer edges of the cone(s)-of-depression over a ten-year period and over a 30-year period;

(4) the recommended minimum spacing limit between wells and the recommended well yield; and

(5) the sufficiency of available groundwater quality to meet the intended use of the platted subdivision.

(b) Groundwater availability determination conditions. The assumptions and uncertainties that are inherent in the determination of groundwater availability should be clearly identified as specified in §230.3(c) of this title. These conditions must be identified to adequately define the bases for the availability and usability statements. These bases may include, but are not limited to, uncontrollable and unknown factors such as:

(1) future pumpage from the aquifer or from interconnected aquifers from area wells outside of the subdivision or any other factor that cannot be predicted that will affect the storage of water in the aquifer;

(2) long-term impacts to the aquifer based on climatic variations; and

(3) future impacts to usable groundwater due to unforeseen or unpredictable contamination.

(c) Certification. Based on best professional judgement, current groundwater conditions, and the information developed and presented in the form specified by §230.3(c) of this title, the licensed professional engineer or licensed professional geoscientist certifies by signature, seal, and date that adequate groundwater is available from the underlying aquifer(s) to supply the estimated demand of the proposed subdivision.

Adopted January 23, 2003 Effective February 13, 2003

FORT WORTH®

Centralized Water and Wastewater Laboratory

2600 SE Loop 820 Fort Worth, Texas 76140 Tel: 817-392-5900 Fax: 817-392-5920

Certificate of Analysis

Friday, June 3, 2022

Bryan Erwin
Erwin Water Well
6991 FM 4
Jacksboro, TX 76458

RE: Final Analytical Report: ErwinWater BE 052622 (104166)

Enclosed are the analytical results for sample(s) received by the laboratory 05/26/2022. Results reported herein conform to the 2016 TNI Standards, where applicable, unless otherwise narrated in the body of the report. All results being reported under this Report Identification Number apply only to the samples analyzed and properly identified with a Sample ID number.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by The City of Fort Worth Water Department Centralized Water and Wastewater Laboratory. A PDF version of this report will be maintained electronically for 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The sample(s) received, and described as recorded in this report will be stored up to 30 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample size exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting The City of Fort Worth Water Department Centralized Water and Wastewater Laboratory to serve your analytical needs. If you have any questions concerning this report, please feel free to contact the Laboratory at (817) 392-5900 any time.

Report Authorization:

David Nelson

David Nelson, Ph.D.
Laboratory Manager

FORT WORTH®

Centralized Water and Wastewater Laboratory

2600 SE Loop 820 Fort Worth, Texas 76140 Tel: 817-392-5900 Fax: 817-392-5920

Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

Sample Summary

Lab ID	Sample ID	Date Collected	Date Received	Sampler	Matrix
10416601	Mesquite Estates	05/26/2022 13:45	05/26/2022 14:52	B Erwin	Drinking Water

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Centralized Water and Wastewater Laboratory

2600 SE Loop 820 Fort Worth, Texas 76140 Tel: 817-392-5900 Fax: 817-392-5920

Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

Workorder Summary

Analysis Results Comments

10416601 (Mesquite Estates) - Hardness as CaCO3

SQ4|Sample received and analyzed without chemical preservation.

10416601 (Mesquite Estates) - pH at 25 °C

HT3|Sample received past hold time.

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Centralized Water and Wastewater Laboratory

2600 SE Loop 820 Fort Worth, Texas 76140 Tel: 817-392-5900 Fax: 817-392-5920

Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

Analytical Results

Parameter	Results	Units	DF	Cert	Analyzed	By	Qual
Lab ID: **10416601**	Date Collected: **05/26/2022 13:45**			Matrix: **Drinking Water**			
Sample ID: **Mesquite Estates**	Date Received: **05/26/2022 14:52**						
GENCHEM (SM 2340C Hardness)							
Hardness as CaCO3	94.6	mg/L	1	TX	05/27/2022 10:50	FR	*
GENCHEM (SM 2510B Conductivity)							
Specific Conductance at 25 °C	2070	umhos/cm	1	TX	05/27/2022 14:20	FR	
GENCHEM (SM 4500H+B pH)							
Temperature	20.0	°C	1		05/26/2022 15:00	LAB	
pH at 25 °C	8.2	Units	1		05/26/2022 15:00	LAB	*
GRAV (SM 2540C TDS)							
Total Dissolved Solids	1280	mg/L	1	TX	05/27/2022 15:20	FR	
IC (EPA 300.0 PartA Anions)							
Chloride	218	mg/L	4	TX	06/01/2022 11:10	KB1	
Fluoride	3.25	mg/L	4	TX	06/01/2022 11:10	KB1	
Nitrate as N	<0.10	mg/L	1	TX	05/26/2022 16:30	CH	
Sulfate	277	mg/L	4	TX	06/01/2022 11:10	KB1	
METALS (EPA 200.8 - ICP-MS Metals Prep/EPA 200.8, ICP-MS Metals)							
Iron	<0.075	mg/L	1		06/02/2022 14:52	MG	
Manganese	<0.0050	mg/L	1	TX	06/02/2022 14:52	MG	
MICROBIOLOGY (SM 9223B Coliforms)							
Total Coliform	Presence		1	TX	05/26/2022 15:47	NR	
E. Coli	Absence		1	TX	05/26/2022 15:47	NR	

Analysis Results Comments

Hardness as CaCO3

SQ4|Sample received and analyzed without chemical preservation.

pH at 25 °C

HT3|Sample received past hold time.

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Centralized Water and Wastewater Laboratory

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Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

QC Results

QC Batch: INOR/85597
Preparation Method: SM 4500H+B pH
Associated Lab IDs: 10416601

Analysis Method: SM 4500H+B pH

Sample Duplicate (427293) ***Original (10415301)***

Parameter	Orig Result	Duplicate	Units	RPD	RPD Limit	Qual
Temperature	21.1	21	°C	0		
pH at 25 °C	7.4	7.4	Units	0		

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Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

QC Results

QC Batch: INOR/85611
Preparation Method: SM 2340C Hardness
Associated Lab IDs: 10416601
Analysis Method: SM 2340C Hardness

Method Blank(427412)

Parameter	Results	Units	RDL	MDL	Qual
Hardness as CaCO3	<2	mg/L	2		

Lab Fortified Blank (427414)

Parameter	Units	Spiked Amount	Spike Result	Spike Rec %	Control Limits	Qual
Hardness as CaCO3	mg/L	50	52.6	105	80 - 120	

Fortified Sample (427416); Fortified Sample Dup (427417) ***Original (10412901)***

Parameter	Orig Result	Units	Spiked Amount	Spike Result	Spike Rec %	Control Limits	Dup Result	Dup Rec %	RPD	RPD Limit	Qual
Hardness as CaCO3	38.2	mg/L	50	89.6	103	80 - 120	89.8	103	0	20	

QC Result Comments

Fortified Sample - 427416 - Hardness as CaCO3

SQ5|Sample received with inadequate chemical preservation, but preserved by the laboratory.

Fortified Sample Dup - 427417 - Hardness as CaCO3

SQ5|Sample received with inadequate chemical preservation, but preserved by the laboratory.

Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

QC Results

QC Batch: INOR/85633
Preparation Method: SM 2510B Conductivity
Associated Lab IDs: 10416601
Analysis Method: SM 2510B Conductivity

Method Blank(427513)

Parameter	Results	Units	RDL	MDL	Qual
Specific Conductance at 25 °C	<0.78	umhos/cm	0.78		

Lab Fortified Blank (427515)

Parameter	Units	Spiked Amount	Spike Result	Spike Rec %	Control Limits	Qual
Specific Conductance at 25 °C	umhos/cm	447	446	100	90 - 110	

Sample Duplicate (427517) ***Original (10412901)***

Parameter	Orig Result	Duplicate	Units	RPD	RPD Limit	Qual
Specific Conductance at 25 °C	2040	2030	umhos/cm	0	20	

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Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

QC Results

QC Batch: INOR/85634
Preparation Method: SM 2540C TDS
Associated Lab IDs: 10416601
Analysis Method: SM 2540C TDS

Method Blank(427519)

Parameter	Results	Units	RDL	MDL	Qual
Total Dissolved Solids	<17.0	mg/L	17.0	6.00	

Lab Fortified Blank (427520)

Parameter	Units	Spiked Amount	Spike Result	Spike Rec %	Control Limits	Qual
Total Dissolved Solids	mg/L	1000	1060	106	80 - 120	

Sample Duplicate (427521) ***Original (10416304)***

Parameter	Orig Result	Duplicate	Units	RPD	RPD Limit	Qual
Total Dissolved Solids	282	281	mg/L	0	10	

Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

QC Results

QC Batch: MET/8322
Preparation Method: EPA 200.8 - ICP-MS Metals Prep
Associated Lab IDs: 10416601
Analysis Method: EPA 200.8, ICP-MS Metals

Lab Reagent Blank(427859)

Parameter	Results	Units	RDL	MDL	Qual
Iron	<0.008	mg/L	0.008		
Manganese	<0.0003	mg/L	0.0003	0.0000	

Lab Fortified Blank (427860)

Parameter	Units	Spiked Amount	Spike Result	Spike Rec %	Control Limits	Qual
Iron	mg/L	5	5.09	102	85 - 115	
Manganese	mg/L	0.10	.1008	101	85 - 115	

Fortified Sample (427862); Fortified Sample Dup (427863) ***Original (10412901)***

Parameter	Orig Result	Units	Spiked Amount	Spike Result	Spike Rec %	Control Limits	Dup Result	Dup Rec %	RPD	RPD Limit	Qual
Iron	0.056	mg/L	5	5.47	108	70 - 130	5.11	101	7	20	
Manganese	0.0034	mg/L	0.10	.1097	106	70 - 130	.1089	105	1	20	

Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

QC Results

QC Batch: MIC/22047
Preparation Method: SM 9223B Coliforms
Associated Lab IDs: 10416601

Analysis Method: SM 9223B Coliforms

QC Blank(427369)

Parameter	Results	Units	RDL	MDL	Qual
Total Coliform	Absence		1		
E. Coli	Absence		1		

QC Positive(427370)

Parameter	Results	Units	RDL	MDL	Qual
Total Coliform	Presence		1		
E. Coli	Presence		1		

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Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

QC Results

QC Batch: ORG/15550
Preparation Method: EPA 300.0 PartA Anions
Associated Lab IDs: 10416601
Analysis Method: EPA 300.0 PartA Anions

Method Blank Filtered(427269)

Parameter	Results	Units	RDL	MDL	Qual
Fluoride	<0.04	mg/L	0.04	0.00	
Chloride	<0.81	mg/L	0.81	0.01	
Nitrate as N	<0.06	mg/L	0.06	0.00	
Sulfate	<0.76	mg/L	0.76	0.01	

Lab Fortified Blank - Filtered (427270)

Parameter	Units	Spiked Amount	Spike Result	Spike Rec %	Control Limits	Qual
Fluoride	mg/L	1	.97	97	90 - 110	
Chloride	mg/L	60	57.5	96	90 - 110	
Nitrate as N	mg/L	2	1.91	96	90 - 110	
Sulfate	mg/L	60	57.4	96	90 - 110	

Fortified Sample (427271); Fortified Sample Dup (427272) Original (10413001)

Parameter	Orig Result	Units	Spiked Amount	Spike Result	Spike Rec %	Control Limits	Dup Result	Dup Rec %	RPD	RPD Limit	Qual
Fluoride	0.16	mg/L	1	1.15	98	80 - 120	1.15	98	0	20	
Chloride	14.3	mg/L	60	72.1	96	80 - 120	72	96	0	20	
Nitrate as N	0.03	mg/L	2	1.95	96	80 - 120	1.95	96	0	20	
Sulfate	37.9	mg/L	60	94.8	95	80 - 120	94.5	94	1	20	

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Certificate of Analysis

Workorder: ErwinWater BE 052622 (104166)

QC Cross Reference

Lab ID	Sample ID	Prep Batch	Prep Method	Analytical Batch	Analytical Method
INOR/85597 - SM 4500H+B pH					
10416601	Mesquite Estates			INOR/85597	SM 4500H+B pH
INOR/85611 - SM 2340C Hardness					
10416601	Mesquite Estates			INOR/85611	SM 2340C Hardness
INOR/85633 - SM 2510B Conductivity					
10416601	Mesquite Estates			INOR/85633	SM 2510B Conductivity
INOR/85634 - SM 2540C TDS					
10416601	Mesquite Estates			INOR/85634	SM 2540C TDS
MET/8322 - EPA 200.8, ICP-MS Metals					
10416601	Mesquite Estates	MET/8318	EPA 200.8 - ICP-MS Metals Prep	MET/8322	EPA 200.8, ICP-MS Metals
MIC/22047 - SM 9223B Coliforms					
10416601	Mesquite Estates			MIC/22047	SM 9223B Coliforms
ORG/15550 - EPA 300.0 PartA Anions					
10416601	Mesquite Estates			ORG/15550	EPA 300.0 PartA Anions

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Please print legibly

CHAIN OF CUSTODY RECORD

Client Contact Information	State (of sample origin)	Project Name	Sampler (Printed)	ARC
Erwin Water Well 6991 FM 4 Jacksboro, TX 76458 [940] 567-5708 bryan@erwindrilling.com	TX	**Prepay** **Groundwater Quality**	**Name of Sampler:** **Bryan Erwin**	104166 Work Order ID: ErwinWater BE 052622

Sample ID #	Collection Date	Collection Time	Sampling Site	Test Name	Sample Remarks	# of Containers	Matrix Code	Sample Type
10416601	5/26/22	1:45 AM (PM)	Mesquite Estates	300.0-Cl; 2510-COND; 300.0-F; 300.0-NO3; 200.8MnDW; 4500-PH; 300.0-SO4; 2340C-HARD; 2540C-TDS; 200.8FeDW; 9223B-COLI		4	DW	G
		AM PM						
		AM PM						
		AM PM						
		AM PM						
		AM PM						
		AM PM						
		AM PM						
		AM PM						
		AM PM						
		AM PM						
		AM PM						
		AM PM						
		AM PM						
		AM PM						

Field Comments: Carrier _____ Airbill No _____ Cooler No. _____ Date Shipped _____

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Date	Time
Bryan Erwin	5/26/22	2:52 AM (PM)	Aaron	5.26.22	1462 AM (PM)
		AM PM			AM PM
		AM PM			AM PM

LAB COMMENTS Project Information Update: 12/08/14

IR Thermometer: N

CONDITIONS UPON RECEIPT (Check One)

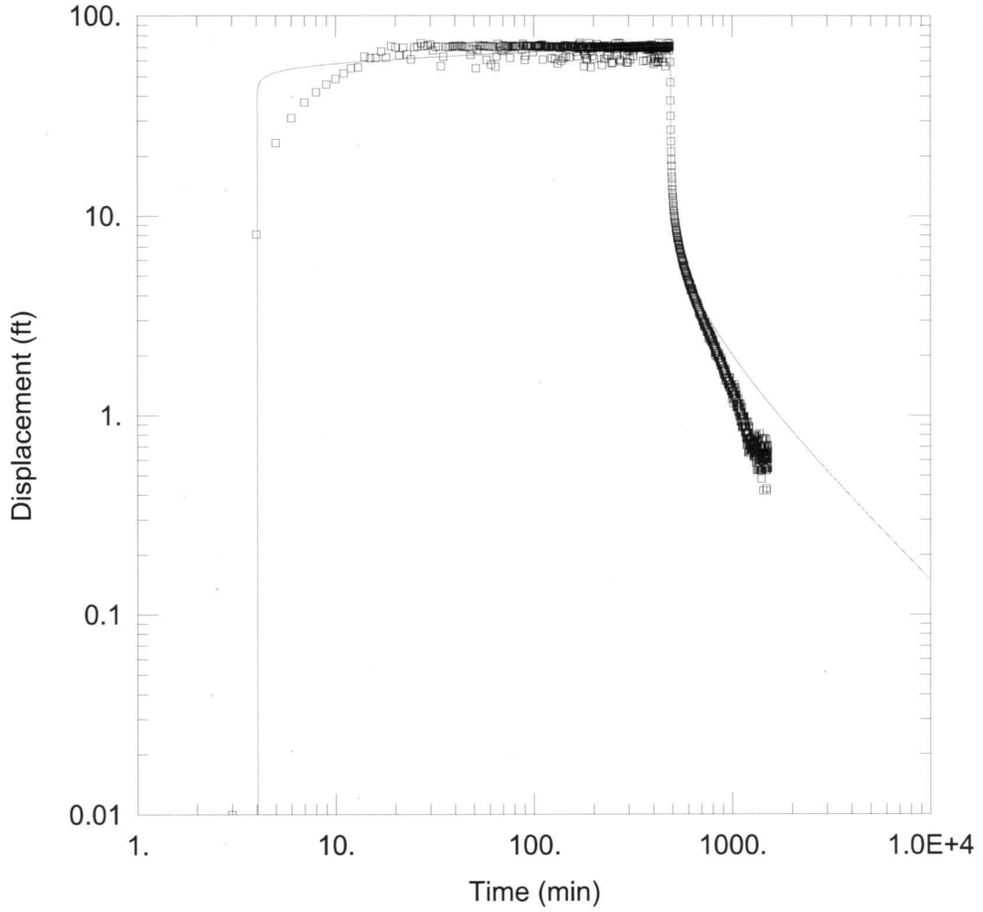
X Ice ___ Ambient 83 °C Upon Receipt

Matrix Codes:
DW=Drinking Water
NP=Non-Potable Water
S=Solid Waste
WW=Wastewater

Sample Types
C=Composite
G=Grab

Container Types
V=VOA Vials
AG=Amber Glass
CG=Clear Glass
P=Plastic

LAB RESERVES THE RIGHT TO RETURN UNUSED PORTIONS OF NON-AQUEOUS SAMPLES TO CLIENT



WELL TEST ANALYSIS

Data Set:
Date: 06/08/22 Time: 00:28:38

PROJECT INFORMATION

Company: AKV
Client: AME
Project: Mesquite Estates
Location: Jacksboro
Test Well: Ex

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Ex Well	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Ex Well	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 569.6 gal/day/ft
Kz/Kr = 1.

S = 6.903E-9
b = 52. ft

AQTESOLV for Windows

Data Set:
Date: 06/08/22
Time: 00:28:06

PROJECT INFORMATION

Company: AKV
Client: AME
Project: Mesquite Estates
Location: Jacksboro
Test Well: Ex

AQUIFER DATA

Saturated Thickness: 52. ft
Anisotropy Ratio (Kz/Kr): 1.

PUMPING WELL DATA

No. of pumping wells: 1

Pumping Well No. 1: Ex Well

X Location: 0. ft
Y Location: 0. ft

Casing Radius: 0.33 ft
Well Radius: 0.67 ft

Fully Penetrating Well

No. of pumping periods: 5

Pumping Period Data

Time (min)	Rate (gal/min)	Time (min)	Rate (gal/min)
1.	0.	486.	15.
3.	0.	487.	0.
4.	15.		

OBSERVATION WELL DATA

No. of observation wells: 1

Observation Well No. 1: Ex Well

X Location: 0. ft
Y Location: 0. ft

Radial distance from Ex Well: 0. ft

Fully Penetrating Well

No. of Observations: 1513

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
1.	0.	758.	2.55
2.	0.	759.	2.55
3.	0.01	760.	2.61
4.	8.09	761.	2.61
5.	23.25	762.	2.44
6.	31.	763.	2.66
7.	37.08	764.	2.5
8.	41.65	765.	2.5
9.	45.5	766.	2.55
10.	48.68	767.	2.55
11.	51.8	768.	2.55

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
12.	54.98	769.	2.55
13.	55.59	770.	2.61
14.	62.84	771.	2.39
15.	61.62	772.	2.55
16.	61.9	773.	2.5
17.	66.52	774.	2.44
18.	62.06	775.	2.44
19.	70.82	776.	2.5
20.	69.7	777.	2.55
21.	63.57	778.	2.5
22.	69.54	779.	2.5
23.	64.52	780.	2.44
24.	60.95	781.	2.44
25.	69.76	782.	2.39
26.	70.59	783.	2.44
27.	73.16	784.	2.5
28.	70.76	785.	2.39
29.	71.1	786.	2.33
30.	72.27	787.	2.39
31.	67.36	788.	2.39
32.	70.21	789.	2.39
33.	70.43	790.	2.33
34.	56.33	791.	2.39
35.	62.73	792.	2.39
36.	70.37	793.	2.39
37.	69.97	794.	2.39
38.	70.25	795.	2.39
39.	70.69	796.	2.44
40.	70.92	797.	2.33
41.	70.36	798.	2.27
42.	71.03	799.	2.33
43.	71.19	800.	2.27
44.	70.08	801.	2.33
45.	70.36	802.	2.33
46.	70.58	803.	2.22
47.	70.47	804.	2.39
48.	64.01	805.	2.22
49.	68.03	806.	2.22
50.	70.7	807.	2.27
51.	54.88	808.	2.22
52.	67.98	809.	2.27
53.	71.43	810.	2.27
54.	70.71	811.	2.27
55.	70.54	812.	2.22
56.	71.32	813.	2.27
57.	70.65	814.	2.16
58.	60.4	815.	2.22
59.	70.99	816.	2.16
60.	70.27	817.	2.16
61.	57.28	818.	2.22
62.	71.05	819.	2.05
63.	69.93	820.	2.22
64.	55.89	821.	2.11
65.	62.74	822.	2.11
66.	72.61	823.	2.11
67.	69.71	824.	1.99
68.	70.55	825.	2.16
69.	66.92	826.	2.16
70.	71.44	827.	2.11
71.	68.71	828.	2.22
72.	70.83	829.	2.11
73.	70.44	830.	2.05
74.	69.77	831.	2.05
75.	70.38	832.	2.11
76.	61.91	833.	2.05
77.	70.66	834.	2.05

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
78.	69.99	835.	2.05
79.	71.27	836.	2.11
80.	70.22	837.	2.11
81.	70.05	838.	2.11
82.	70.33	839.	1.99
83.	70.6	840.	1.99
84.	70.38	841.	1.99
85.	70.32	842.	1.99
86.	70.66	843.	1.99
87.	67.76	844.	2.05
88.	72.61	845.	2.05
89.	71.27	846.	2.05
90.	60.35	847.	1.99
91.	63.36	848.	2.05
92.	70.83	849.	1.94
93.	70.83	850.	1.94
94.	70.38	851.	1.99
95.	71.	852.	1.99
96.	70.33	853.	1.99
97.	70.22	854.	1.94
98.	70.16	855.	1.94
99.	66.03	856.	1.99
100.	70.38	857.	1.99
101.	70.94	858.	1.99
102.	70.33	859.	1.99
103.	71.16	860.	2.05
104.	70.22	861.	1.94
105.	69.99	862.	1.94
106.	71.22	863.	1.94
107.	70.55	864.	1.94
108.	70.77	865.	1.88
109.	71.66	866.	1.88
110.	71.78	867.	1.94
111.	60.52	868.	1.88
112.	70.22	869.	1.83
113.	70.27	870.	1.88
114.	71.11	871.	1.88
115.	70.55	872.	1.88
116.	70.33	873.	1.88
117.	69.71	874.	1.88
118.	69.94	875.	1.83
119.	69.88	876.	1.88
120.	70.33	877.	1.88
121.	69.66	878.	1.88
122.	70.22	879.	1.77
123.	61.8	880.	1.94
124.	70.77	881.	1.77
125.	70.6	882.	1.83
126.	69.99	883.	1.77
127.	70.33	884.	1.83
128.	61.13	885.	1.77
129.	70.38	886.	1.83
130.	70.61	887.	1.83
131.	70.72	888.	1.88
132.	58.12	889.	1.77
133.	70.27	890.	1.77
134.	70.66	891.	1.83
135.	69.27	892.	1.77
136.	69.54	893.	1.71
137.	59.79	894.	1.71
138.	69.77	895.	1.77
139.	69.27	896.	1.77
140.	70.1	897.	1.77
141.	61.74	898.	1.77
142.	70.83	899.	1.66
143.	71.44	900.	1.77

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
144.	70.99	901.	1.77
145.	62.97	902.	1.77
146.	69.94	903.	1.71
147.	70.38	904.	1.71
148.	69.94	905.	1.71
149.	70.77	906.	1.71
150.	71.22	907.	1.66
151.	62.35	908.	1.6
152.	71.16	909.	1.66
153.	69.82	910.	1.71
154.	69.94	911.	1.71
155.	70.94	912.	1.71
156.	71.22	913.	1.71
157.	70.05	914.	1.6
158.	69.82	915.	1.6
159.	70.72	916.	1.66
160.	69.55	917.	1.6
161.	70.1	918.	1.66
162.	71.05	919.	1.66
163.	71.	920.	1.6
164.	66.31	921.	1.66
165.	69.71	922.	1.66
166.	70.33	923.	1.66
167.	63.02	924.	1.66
168.	69.1	925.	1.66
169.	71.94	926.	1.49
170.	71.	927.	1.71
171.	73.45	928.	1.55
172.	68.66	929.	1.55
173.	70.05	930.	1.55
174.	69.6	931.	1.6
175.	70.33	932.	1.6
176.	70.77	933.	1.6
177.	69.94	934.	1.6
178.	70.1	935.	1.6
179.	56.33	936.	1.6
180.	67.15	937.	1.6
181.	64.53	938.	1.49
182.	64.36	939.	1.49
183.	69.55	940.	1.55
184.	60.52	941.	1.49
185.	69.83	942.	1.49
186.	61.52	943.	1.55
187.	68.66	944.	1.55
188.	70.38	945.	1.55
189.	68.77	946.	1.55
190.	73.28	947.	1.55
191.	69.77	948.	1.55
192.	70.22	949.	1.49
193.	67.32	950.	1.55
194.	55.44	951.	1.55
195.	69.82	952.	1.43
196.	70.88	953.	1.43
197.	70.21	954.	1.43
198.	63.3	955.	1.49
199.	69.32	956.	1.49
200.	69.66	957.	1.49
201.	61.24	958.	1.43
202.	70.21	959.	1.49
203.	70.16	960.	1.43
204.	70.21	961.	1.49
205.	69.66	962.	1.43
206.	70.05	963.	1.49
207.	70.77	964.	1.49
208.	72.39	965.	1.55
209.	70.16	966.	1.49

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
210.	70.16	967.	1.49
211.	70.77	968.	1.38
212.	69.21	969.	1.49
213.	70.77	970.	1.49
214.	69.6	971.	1.38
215.	69.44	972.	1.55
216.	70.44	973.	1.43
217.	70.22	974.	1.43
218.	70.22	975.	1.38
219.	70.11	976.	1.43
220.	70.16	977.	1.43
221.	57.06	978.	1.38
222.	70.67	979.	1.43
223.	69.83	980.	1.43
224.	70.33	981.	1.43
225.	71.28	982.	1.43
226.	61.36	983.	1.43
227.	70.83	984.	1.43
228.	70.33	985.	1.43
229.	70.27	986.	1.32
230.	61.35	987.	1.32
231.	70.05	988.	1.43
232.	69.83	989.	1.32
233.	70.22	990.	1.32
234.	64.36	991.	1.32
235.	69.27	992.	1.32
236.	69.66	993.	1.38
237.	63.3	994.	1.38
238.	71.11	995.	1.38
239.	69.6	996.	1.38
240.	69.1	997.	1.38
241.	70.05	998.	1.43
242.	69.55	999.	1.32
243.	70.61	1000.	1.32
244.	70.27	1001.	1.21
245.	69.44	1002.	1.27
246.	70.27	1003.	1.38
247.	58.23	1004.	1.27
248.	69.94	1005.	1.38
249.	69.72	1006.	1.32
250.	58.57	1007.	1.27
251.	69.94	1008.	1.27
252.	70.11	1009.	1.27
253.	70.72	1010.	1.27
254.	69.55	1011.	1.32
255.	70.61	1012.	1.27
256.	70.55	1013.	1.32
257.	69.44	1014.	1.32
258.	73.06	1015.	1.27
259.	69.49	1016.	1.32
260.	70.22	1017.	1.38
261.	70.83	1018.	1.15
262.	63.75	1019.	1.21
263.	68.26	1020.	1.32
264.	63.75	1021.	1.21
265.	69.32	1022.	1.27
266.	70.27	1023.	1.21
267.	73.45	1024.	1.27
268.	70.33	1025.	1.27
269.	69.33	1026.	1.27
270.	70.27	1027.	1.27
271.	60.63	1028.	1.43
272.	70.16	1029.	1.21
273.	73.	1030.	1.27
274.	70.16	1031.	1.27
275.	59.62	1032.	1.27

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
276.	70.44	1033.	1.27
277.	70.94	1034.	1.27
278.	69.77	1035.	1.27
279.	69.49	1036.	1.27
280.	70.94	1037.	1.27
281.	70.44	1038.	1.27
282.	69.71	1039.	1.27
283.	69.99	1040.	1.32
284.	70.72	1041.	1.38
285.	69.38	1042.	1.27
286.	70.38	1043.	1.21
287.	69.66	1044.	1.27
288.	70.11	1045.	1.15
289.	69.6	1046.	1.21
290.	70.05	1047.	1.21
291.	69.94	1048.	1.21
292.	70.1	1049.	1.21
293.	70.66	1050.	1.21
294.	58.9	1051.	1.15
295.	70.05	1052.	1.15
296.	69.04	1053.	1.1
297.	67.04	1054.	1.21
298.	58.73	1055.	1.27
299.	70.05	1056.	1.21
300.	68.82	1057.	1.21
301.	70.77	1058.	1.15
302.	69.94	1059.	1.1
303.	67.6	1060.	1.15
304.	71.05	1061.	1.15
305.	70.27	1062.	1.15
306.	60.85	1063.	1.15
307.	69.99	1064.	1.15
308.	70.77	1065.	1.15
309.	70.05	1066.	1.1
310.	69.21	1067.	1.15
311.	70.89	1068.	1.15
312.	70.5	1069.	1.15
313.	69.49	1070.	1.15
314.	70.33	1071.	1.15
315.	70.5	1072.	1.15
316.	70.16	1073.	1.04
317.	63.25	1074.	1.04
318.	70.5	1075.	1.21
319.	67.32	1076.	1.04
320.	69.1	1077.	1.04
321.	71.11	1078.	1.1
322.	69.55	1079.	1.1
323.	70.16	1080.	1.1
324.	70.33	1081.	1.15
325.	70.55	1082.	1.1
326.	69.27	1083.	1.1
327.	70.55	1084.	1.1
328.	70.94	1085.	1.1
329.	69.61	1086.	1.1
330.	69.44	1087.	1.1
331.	70.83	1088.	1.1
332.	69.88	1089.	1.1
333.	69.6	1090.	0.99
334.	70.05	1091.	1.1
335.	70.5	1092.	0.99
336.	70.55	1093.	1.04
337.	69.72	1094.	0.99
338.	68.99	1095.	1.15
339.	70.89	1096.	1.1
340.	70.22	1097.	1.1
341.	69.88	1098.	1.1

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
342.	69.94	1099.	1.15
343.	70.61	1100.	1.04
344.	69.38	1101.	1.04
345.	69.83	1102.	1.04
346.	70.77	1103.	0.93
347.	70.94	1104.	0.99
348.	70.33	1105.	1.04
349.	69.49	1106.	1.04
350.	70.27	1107.	1.04
351.	71.28	1108.	1.04
352.	70.44	1109.	0.99
353.	69.55	1110.	1.04
354.	70.55	1111.	1.04
355.	70.66	1112.	0.99
356.	59.63	1113.	1.04
357.	69.16	1114.	0.93
358.	70.61	1115.	1.1
359.	69.55	1116.	1.04
360.	70.27	1117.	0.99
361.	70.	1118.	1.1
362.	69.6	1119.	1.04
363.	70.49	1120.	0.93
364.	70.77	1121.	0.99
365.	70.16	1122.	0.99
366.	70.05	1123.	0.87
367.	71.	1124.	0.99
368.	70.5	1125.	0.99
369.	70.05	1126.	0.99
370.	59.96	1127.	0.93
371.	67.71	1128.	0.88
372.	70.66	1129.	0.88
373.	69.94	1130.	0.99
374.	69.72	1131.	0.99
375.	69.99	1132.	0.99
376.	68.6	1133.	0.99
377.	70.77	1134.	0.99
378.	69.83	1135.	0.99
379.	69.66	1136.	0.88
380.	67.6	1137.	0.99
381.	69.94	1138.	0.88
382.	68.1	1139.	0.88
383.	70.33	1140.	0.99
384.	71.67	1141.	0.99
385.	69.71	1142.	0.93
386.	68.88	1143.	0.93
387.	69.32	1144.	0.93
388.	70.33	1145.	0.93
389.	71.11	1146.	0.93
390.	71.94	1147.	0.93
391.	69.66	1148.	0.93
392.	61.13	1149.	0.93
393.	70.89	1150.	0.88
394.	69.66	1151.	0.99
395.	69.55	1152.	0.93
396.	69.27	1153.	0.93
397.	69.77	1154.	0.99
398.	69.55	1155.	0.87
399.	71.11	1156.	0.99
400.	69.21	1157.	0.93
401.	71.05	1158.	0.88
402.	57.9	1159.	0.93
403.	69.71	1160.	0.82
404.	68.65	1161.	0.93
405.	61.24	1162.	0.93
406.	71.11	1163.	0.93
407.	69.88	1164.	0.88

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
408.	62.3	1165.	0.88
409.	70.16	1166.	0.82
410.	70.77	1167.	0.88
411.	58.96	1168.	0.82
412.	69.83	1169.	0.82
413.	69.6	1170.	0.88
414.	71.16	1171.	0.88
415.	70.55	1172.	0.82
416.	68.82	1173.	0.88
417.	64.25	1174.	0.82
418.	69.99	1175.	0.82
419.	69.99	1176.	0.88
420.	69.82	1177.	0.93
421.	67.37	1178.	0.77
422.	58.84	1179.	0.88
423.	59.07	1180.	0.88
424.	59.51	1181.	0.88
425.	69.82	1182.	0.82
426.	69.21	1183.	0.93
427.	61.35	1184.	0.82
428.	73.5	1185.	0.76
429.	70.1	1186.	0.71
430.	63.64	1187.	0.82
431.	70.16	1188.	0.76
432.	70.94	1189.	0.76
433.	70.88	1190.	0.76
434.	70.1	1191.	0.76
435.	69.88	1192.	0.76
436.	69.66	1193.	0.82
437.	70.99	1194.	0.82
438.	70.55	1195.	0.82
439.	69.71	1196.	0.82
440.	69.54	1197.	0.71
441.	70.49	1198.	0.82
442.	61.85	1199.	0.77
443.	70.71	1200.	0.82
444.	69.54	1201.	0.82
445.	68.87	1202.	0.82
446.	69.54	1203.	0.93
447.	70.1	1204.	0.82
448.	70.32	1205.	0.82
449.	70.88	1206.	0.77
450.	69.49	1207.	0.65
451.	59.12	1208.	0.82
452.	70.16	1209.	0.88
453.	70.27	1210.	0.77
454.	70.94	1211.	0.82
455.	69.43	1212.	0.77
456.	69.15	1213.	0.71
457.	70.44	1214.	0.77
458.	70.77	1215.	0.65
459.	70.94	1216.	0.71
460.	67.37	1217.	0.77
461.	56.22	1218.	0.88
462.	69.71	1219.	0.66
463.	70.88	1220.	0.77
464.	70.27	1221.	0.71
465.	69.65	1222.	0.71
466.	69.32	1223.	0.71
467.	68.54	1224.	0.77
468.	68.82	1225.	0.77
469.	69.77	1226.	0.77
470.	69.26	1227.	0.71
471.	70.21	1228.	0.77
472.	70.16	1229.	0.77
473.	69.99	1230.	0.77

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
474.	69.43	1231.	0.71
475.	73.44	1232.	0.77
476.	70.66	1233.	0.77
477.	70.49	1234.	0.71
478.	71.05	1235.	0.77
479.	70.71	1236.	0.66
480.	70.38	1237.	0.77
481.	69.65	1238.	0.77
482.	67.42	1239.	0.66
483.	72.83	1240.	0.77
484.	70.88	1241.	0.77
485.	71.1	1242.	0.72
486.	70.1	1243.	0.66
487.	59.12	1244.	0.77
488.	46.74	1245.	0.77
489.	37.88	1246.	0.77
490.	31.63	1247.	0.72
491.	27.01	1248.	0.66
492.	23.66	1249.	0.66
493.	21.04	1250.	0.66
494.	19.15	1251.	0.72
495.	17.81	1252.	0.78
496.	16.53	1253.	0.78
497.	15.64	1254.	0.72
498.	14.8	1255.	0.67
499.	14.13	1256.	0.78
500.	13.52	1257.	0.67
501.	13.02	1258.	0.78
502.	12.68	1259.	0.67
503.	12.24	1260.	0.67
504.	11.84	1261.	0.73
505.	11.51	1262.	0.73
506.	11.23	1263.	0.67
507.	11.12	1264.	0.67
508.	10.73	1265.	0.67
509.	10.56	1266.	0.67
510.	10.34	1267.	0.73
511.	10.06	1268.	0.73
512.	9.95	1269.	0.73
513.	9.73	1270.	0.67
514.	9.73	1271.	0.73
515.	9.5	1272.	0.67
516.	9.34	1273.	0.67
517.	9.22	1274.	0.67
518.	9.11	1275.	0.73
519.	8.89	1276.	0.68
520.	8.78	1277.	0.68
521.	8.61	1278.	0.73
522.	8.56	1279.	0.79
523.	8.44	1280.	0.73
524.	8.39	1281.	0.62
525.	8.22	1282.	0.68
526.	8.16	1283.	0.68
527.	8.11	1284.	0.73
528.	8.05	1285.	0.73
529.	7.83	1286.	0.79
530.	7.89	1287.	0.73
531.	7.66	1288.	0.73
532.	7.66	1289.	0.68
533.	7.55	1290.	0.62
534.	7.55	1291.	0.74
535.	7.5	1292.	0.62
536.	7.33	1293.	0.68
537.	7.33	1294.	0.68
538.	7.22	1295.	0.68
539.	7.16	1296.	0.74

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
540.	7.05	1297.	0.79
541.	7.1	1298.	0.74
542.	6.94	1299.	0.8
543.	6.88	1300.	0.74
544.	6.82	1301.	0.63
545.	6.77	1302.	0.63
546.	6.71	1303.	0.63
547.	6.71	1304.	0.8
548.	6.6	1305.	0.63
549.	6.6	1306.	0.8
550.	6.49	1307.	0.69
551.	6.49	1308.	0.74
552.	6.43	1309.	0.63
553.	6.43	1310.	0.69
554.	6.32	1311.	0.69
555.	6.32	1312.	0.63
556.	6.21	1313.	0.69
557.	6.15	1314.	0.63
558.	6.15	1315.	0.69
559.	6.1	1316.	0.69
560.	6.04	1317.	0.58
561.	5.93	1318.	0.69
562.	5.87	1319.	0.75
563.	5.93	1320.	0.63
564.	5.99	1321.	0.69
565.	5.82	1322.	0.69
566.	5.71	1323.	0.69
567.	5.82	1324.	0.8
568.	5.7	1325.	0.64
569.	5.7	1326.	0.75
570.	5.65	1327.	0.69
571.	5.54	1328.	0.69
572.	5.54	1329.	0.64
573.	5.65	1330.	0.53
574.	5.59	1331.	0.58
575.	5.65	1332.	0.69
576.	5.48	1333.	0.64
577.	5.31	1334.	0.69
578.	5.42	1335.	0.64
579.	5.31	1336.	0.64
580.	5.31	1337.	0.64
581.	5.25	1338.	0.69
582.	5.31	1339.	0.64
583.	5.25	1340.	0.64
584.	5.2	1341.	0.64
585.	5.09	1342.	0.64
586.	5.2	1343.	0.64
587.	5.09	1344.	0.64
588.	5.14	1345.	0.75
589.	5.14	1346.	0.64
590.	4.97	1347.	0.64
591.	4.97	1348.	0.64
592.	4.97	1349.	0.64
593.	5.03	1350.	0.53
594.	4.92	1351.	0.53
595.	4.92	1352.	0.64
596.	4.92	1353.	0.58
597.	4.8	1354.	0.58
598.	4.91	1355.	0.7
599.	4.8	1356.	0.58
600.	4.75	1357.	0.75
601.	4.75	1358.	0.58
602.	4.69	1359.	0.53
603.	4.63	1360.	0.64
604.	4.58	1361.	0.64
605.	4.69	1362.	0.64

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
606.	4.69	1363.	0.59
607.	4.63	1364.	0.64
608.	4.63	1365.	0.59
609.	4.46	1366.	0.64
610.	4.52	1367.	0.64
611.	4.58	1368.	0.64
612.	4.46	1369.	0.59
613.	4.52	1370.	0.64
614.	4.46	1371.	0.64
615.	4.41	1372.	0.7
616.	4.41	1373.	0.81
617.	4.52	1374.	0.59
618.	4.24	1375.	0.59
619.	4.35	1376.	0.53
620.	4.29	1377.	0.7
621.	4.35	1378.	0.7
622.	4.35	1379.	0.64
623.	4.24	1380.	0.64
624.	4.24	1381.	0.53
625.	4.24	1382.	0.64
626.	4.35	1383.	0.64
627.	4.18	1384.	0.64
628.	4.24	1385.	0.7
629.	4.18	1386.	0.59
630.	4.18	1387.	0.59
631.	4.18	1388.	0.7
632.	4.18	1389.	0.64
633.	4.12	1390.	0.53
634.	4.07	1391.	0.7
635.	4.01	1392.	0.59
636.	4.07	1393.	0.64
637.	4.07	1394.	0.64
638.	4.07	1395.	0.59
639.	4.01	1396.	0.7
640.	4.01	1397.	0.7
641.	3.95	1398.	0.7
642.	3.9	1399.	0.53
643.	3.9	1400.	0.59
644.	3.95	1401.	0.64
645.	3.9	1402.	0.7
646.	3.84	1403.	0.7
647.	3.84	1404.	0.48
648.	3.79	1405.	0.59
649.	3.79	1406.	0.7
650.	3.84	1407.	0.7
651.	3.79	1408.	0.53
652.	3.73	1409.	0.65
653.	3.73	1410.	0.59
654.	3.79	1411.	0.7
655.	3.79	1412.	0.76
656.	3.67	1413.	0.65
657.	3.73	1414.	0.65
658.	3.73	1415.	0.53
659.	3.62	1416.	0.65
660.	3.67	1417.	0.65
661.	3.62	1418.	0.76
662.	3.67	1419.	0.7
663.	3.62	1420.	0.7
664.	3.56	1421.	0.59
665.	3.56	1422.	0.65
666.	3.62	1423.	0.65
667.	3.67	1424.	0.54
668.	3.56	1425.	0.65
669.	3.56	1426.	0.76
670.	3.51	1427.	0.59
671.	3.56	1428.	0.54

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
672.	3.51	1429.	0.59
673.	3.45	1430.	0.65
674.	3.45	1431.	0.59
675.	3.51	1432.	0.42
676.	3.51	1433.	0.59
677.	3.39	1434.	0.59
678.	3.45	1435.	0.65
679.	3.45	1436.	0.65
680.	3.28	1437.	0.59
681.	3.39	1438.	0.65
682.	3.23	1439.	0.65
683.	3.34	1440.	0.59
684.	3.34	1441.	0.7
685.	3.28	1442.	0.59
686.	3.28	1443.	0.65
687.	3.34	1444.	0.71
688.	3.28	1445.	0.6
689.	3.23	1446.	0.65
690.	3.23	1447.	0.54
691.	3.22	1448.	0.6
692.	3.28	1449.	0.6
693.	3.17	1450.	0.65
694.	3.22	1451.	0.6
695.	3.17	1452.	0.77
696.	3.22	1453.	0.71
697.	3.22	1454.	0.6
698.	3.11	1455.	0.54
699.	3.22	1456.	0.71
700.	3.17	1457.	0.6
701.	3.17	1458.	0.6
702.	3.17	1459.	0.71
703.	3.11	1460.	0.65
704.	3.17	1461.	0.6
705.	3.17	1462.	0.6
706.	3.06	1463.	0.54
707.	3.11	1464.	0.6
708.	2.95	1465.	0.6
709.	3.	1466.	0.65
710.	3.	1467.	0.6
711.	3.	1468.	0.6
712.	3.06	1469.	0.65
713.	3.06	1470.	0.65
714.	2.95	1471.	0.65
715.	2.95	1472.	0.65
716.	2.95	1473.	0.54
717.	2.95	1474.	0.6
718.	2.94	1475.	0.65
719.	2.89	1476.	0.71
720.	2.78	1477.	0.54
721.	2.95	1478.	0.76
722.	2.89	1479.	0.59
723.	2.94	1480.	0.53
724.	2.94	1481.	0.59
725.	2.94	1482.	0.59
726.	2.83	1483.	0.42
727.	2.94	1484.	0.53
728.	2.83	1485.	0.64
729.	2.94	1486.	0.64
730.	2.89	1487.	0.64
731.	2.89	1488.	0.59
732.	2.89	1489.	0.59
733.	2.78	1490.	0.65
734.	2.78	1491.	0.59
735.	2.83	1492.	0.59
736.	2.83	1493.	0.43
737.	2.78	1494.	0.65

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
738.	2.72	1495.	0.54
739.	2.72	1496.	0.71
740.	2.78	1497.	0.54
741.	2.78	1498.	0.71
742.	2.78	1499.	0.54
743.	2.78	1500.	0.65
744.	2.78	1501.	0.66
745.	2.67	1502.	0.66
746.	2.67	1503.	0.6
747.	2.61	1504.	0.66
748.	2.67	1505.	0.71
749.	2.61	1506.	0.54
750.	2.72	1507.	0.54
751.	2.61	1508.	0.54
752.	2.78	1509.	0.54
753.	2.61	1510.	0.66
754.	2.66	1511.	0.6
755.	2.67	1512.	0.66
756.	2.66	1513.	0.54
757.	2.66		

SOLUTION

Pumping Test
Aquifer Model: Confined
Solution Method: Theis

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
T	569.6	gal/day/ft
S	6.903E-9	
Kz/Kr	1.	
b	52.	ft

K = T/b = 10.95 gal/day/ft² (0.0005165 cm/sec)
Ss = S/b = 1.327E-10 1/ft

AUTOMATIC ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	Std. Error	Approx. C.I.	t-Ratio	
T	569.6	12.99	+/- 25.48	43.84	gal/day/ft
S	6.903E-9	3.407E-9	+/- 6.681E-9	2.026	
Kz/Kr	1.	not estimated			
b	52.	not estimated			ft

C.I. is approximate 95% confidence interval for parameter
t-ratio = estimate/std. error
No estimation window

K = T/b = 10.95 gal/day/ft² (0.0005165 cm/sec)
Ss = S/b = 1.327E-10 1/ft

Parameter Correlations

	T	S
T	1.00	-1.00
S	-1.00	1.00

Residual Statistics

for weighted residuals

Sum of Squares . . . . . 1.285E+4 ft^2
Variance . . . . . 8.501 ft^2
Std. Deviation . . . . . 2.916 ft
Mean . . . . . -0.2657 ft
No. of Residuals 1513
No. of Estimates 2