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NATURAL GAS & QUALITY MEASUREMENT

OPERATIONS/DESIGN/SETTLEMENT AUDIT

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December 6, 2000

Michael E. Stogner
Hearing Examiner
Oil Conservation Division
New Mexico Department of Energy, Minerals,
and Natural Resources
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Reference: Oil Conservation Division Case NO. 12520

Dear Mr. Stogner:

Pursuant to your request, enclosed are exceptions to BP Amoco's Proposed Order of the Division for removal of the tubing in the Dakota wells and deep Gallup formations producing gas, condensate or water.

By copy of this letter, I am sending a copy of these exceptions to Frank Chavez for his review.

By virtue of my experience in forty years of gas volume and quality measurement with El Paso Natural Gas Company, (1955-1995) and as Director-Measurement Technical Operations (1985-1995), I have reviewed the chart production from all San Juan Basin formations in regard to their geological and production characteristics related to volume measurement on thousands of charts for time, pressures, and coefficient events leading to exceptions to the proposed order by BP Amoco.

Since I was unable to attend the October 19, 2000 Examiner Hearing, Mr. Frank Chavez suggested that I send a letter to Ms. Lori Wrotenbery-Director, NMOCC (dated 10-16-2000) protesting the proposed downhole commingling which you acknowledged as received.

With all due respect to BP Amoco witnesses and their testimony, exception is taken to their conclusions based on average gas flow rates for the Dakota and Gallup formations. Removal of the tubing in deep formations will contribute to the loss of periodic flow rates required to lift free liquids to the surface (depending on depth and tubing size-200 to 400 MCF/DA flow rates required to clear liquids) resulting in deep formations logging off and only entrained liquids reaching the surface. Depending on casing size, the flow rates required to lift deep formation free liquids will increase 4 to 8 times. This will never occur! Since well production in many wells are now measured with Electronic Flow Measurement (EFM) devices that produce only average volume hourly/daily flow rates, how will BP Amoco determine that Dakota and Gallup formations have logged off and are no longer producing? Thus, commingling Dakota and deep well production will result in the permanent loss of revenues due to logging off and the value of the total remaining production from the deeper wells in the Unit.

The nature of the wellbore fracturing is a component of overburden pressures that result in essentially horizontal or downward fracture patterns for the Picture Cliff and shallower formations. The Dakota fractures are essentially vertically inclined (as well as the Gallup) which contributes to the rapid logging off of production from free liquids.

If the tubing is removed, the free liquids from crossflow from the shallower formations will migrate to the well bottom and contribute to the rapid logging off of the Dakota and/or Gallup well production formations.

Thus, removal of the Dakota tubing will, in fact, not protect the correlative rights of royalty and other interest owners where interests are not common due to the loss of production from those deeper formations in question.

It is problematic how BP Amoco will determine and utilize their proposed allocations for commingled wells in the Gallegos Canyon Unit when tubing removal will contribute to the eventual change in and loss of production from the deeper formations logging off. Who would risk authorizing the pumping "on" of the deep formations when they find difficulty in determining logged off conditions from EFM average flow rates?

Attached are copies or depictions of tubing production patterns derived from charts:

- DK #1 - Typical high production flow rates that never completely log off with gas bubbling through liquids until formation pressure builds up to unload well.
- DK #2 - Typical mid range flow rates that eventually log off (Code 29) and await formation pressure buildup to unload the well bore.
- DK #3 - Typical low range flow rates that rapidly log off (Code 29) and try to unload as bottom hole pressure increases; continued logged off until sufficient down hole pressure finally increases to periodically unload the well bore through the tubing.
- DK #4 - Typical low flow range wells that utilize timed or pressure differences between tubing and casing to activate downhole piston travel to the surface lifting liquids with a burst of increased bottom hole pressure to provide energy for liquid lift (flow 15 minutes - off 3 hours 15 minutes to build up pressure).
- DK #5 - Typical low flow range wells that utilize timed surface "on-off" stop cock cycle equipment to shut in and produce for short periods to lift free liquid (On 20 minutes-Off 1 hour 40 minutes).
  Note: Methods #4 and #5 preserve reservoir gas drive to increase liquid recovery over an extended period.
- PC #6 - Typical low flow Pictured Cliff formation production with horizontal well fractures that does not lend itself to immediate well logging off and which unload at lower flow rates through the tubing.

Several of the Gallegos unit wells are not 100 per cent communitized and were drilled on a lease hold basis.

The administrative notification burden must remain for wells that have non-committed royalty and overriding royalty interests to ensure proper allocation is determined.

Recommendations:
First - the allocation method adopted for each unit well with a non-committed royalty owner should result in a revised Division Order and C107 for each such well. Further, the BP Amoco Tulsa Royalty Services Accounting Division should be ordered to utilize such revised Division

unapproved interest ownership percentages that do not match the Division Orders or Lease Terms in force resulting in violation of the Oil and Gas Act and Payment Act - Sections 70-2-18, 70-10-3, and 70-10-5.

Second - removal of the production tubing on Dakota and other deep formation wells should not be approved for commingling.

Third - BP Amoco should devise a commingling plan for shallower formations that leaves deep formation production tubing in place.

Your assistance in this matter will be appreciated. Thank you.

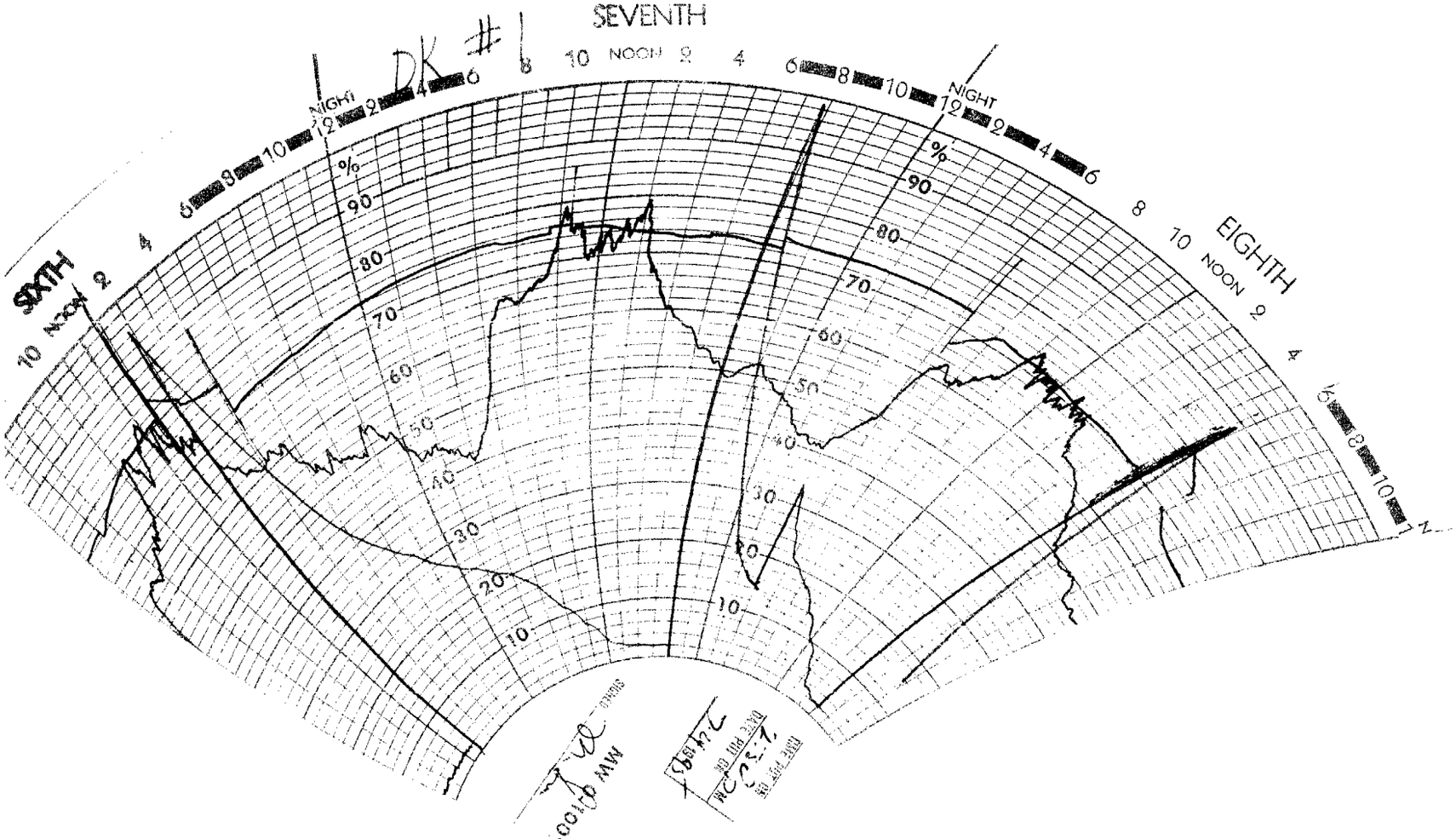
Sincerely yours,

Carroll E. Crawford

Carroll E. Crawford

Copy: Mr. Frank Chavez
District Supersivor
Oil Conservation Division
1000 Rio Brazos Road
Aztec, New Mexico 87410
Phone (505) 334-6178

Attachments: Six (6)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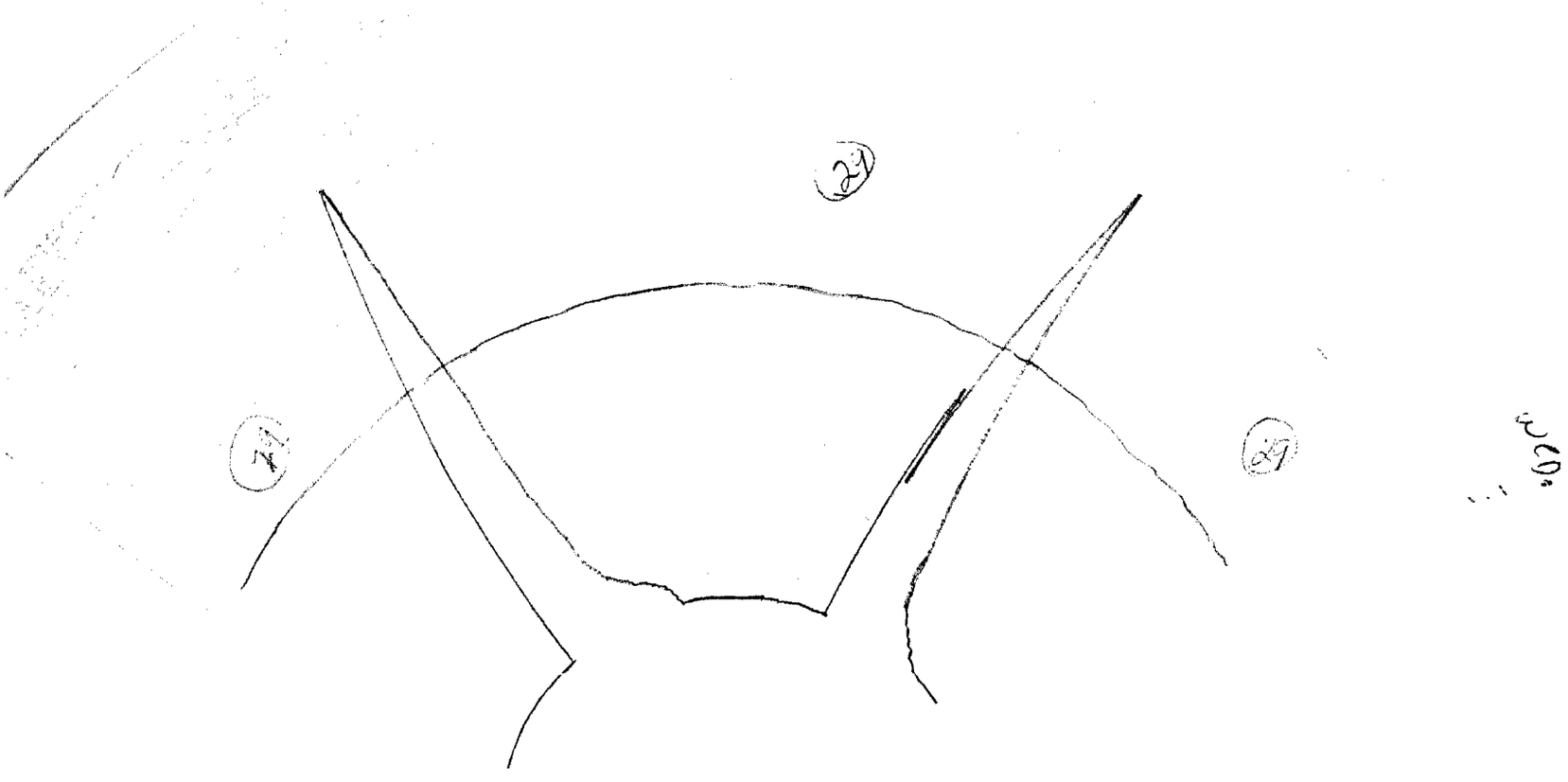

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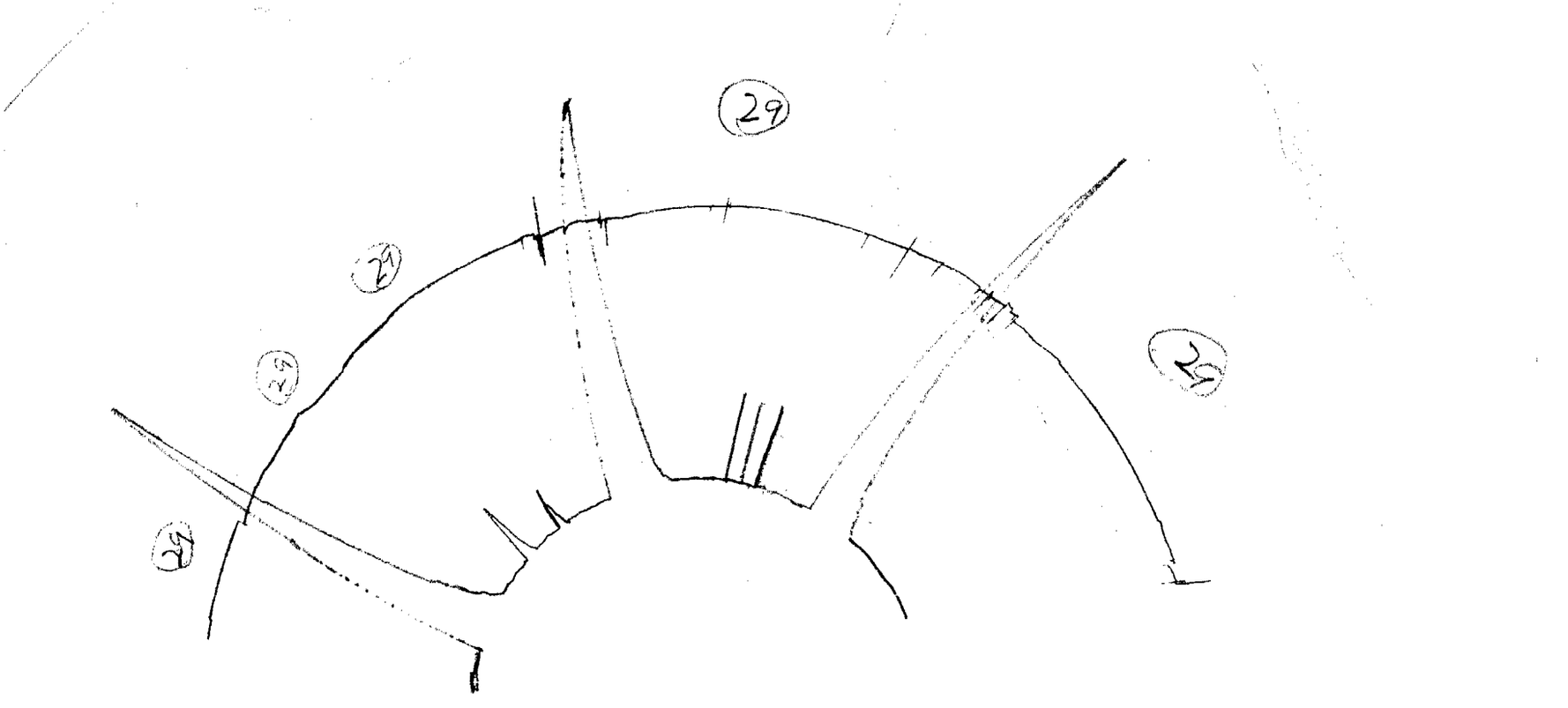

DK #4
PISTON

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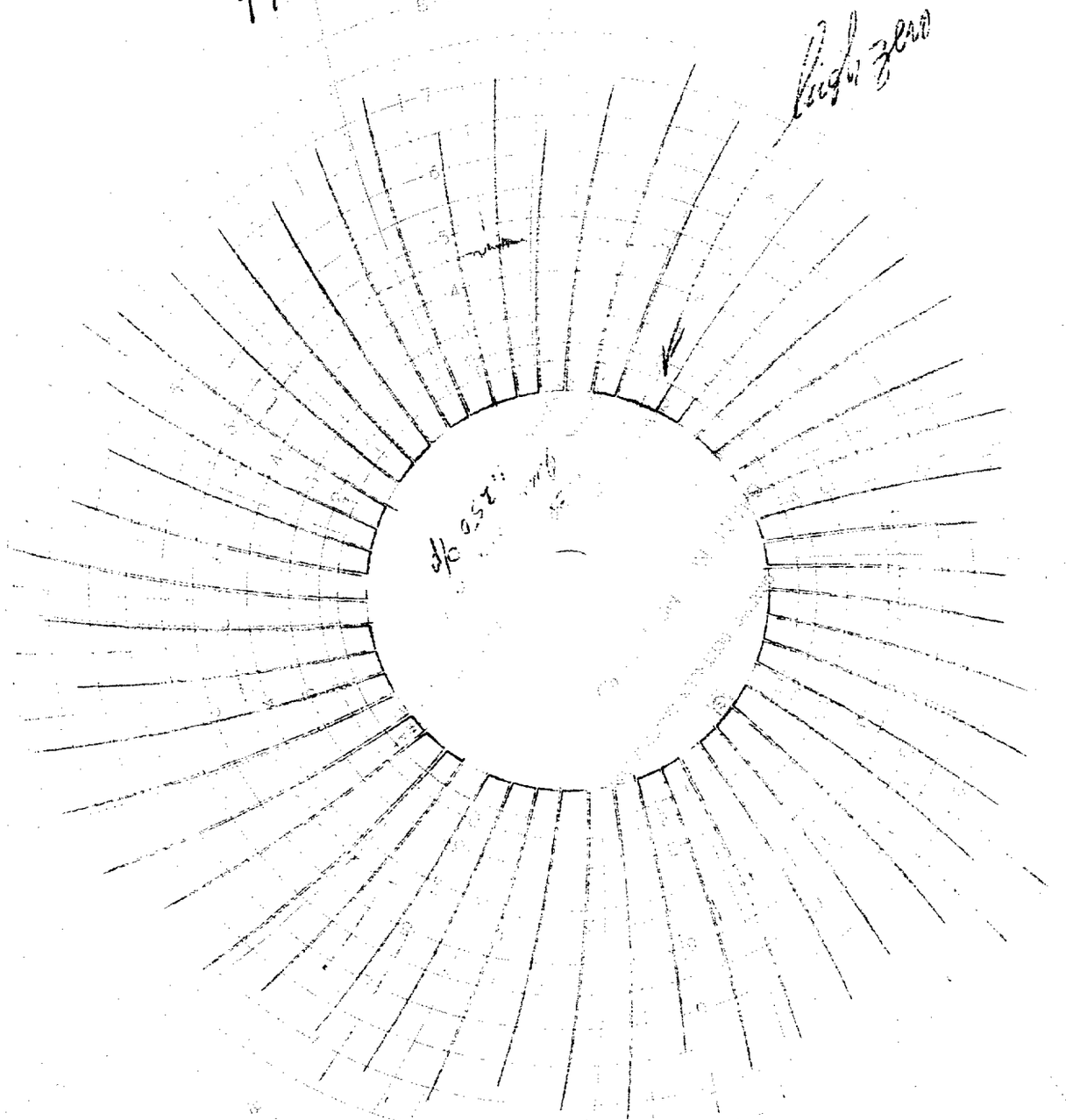

DK # 5

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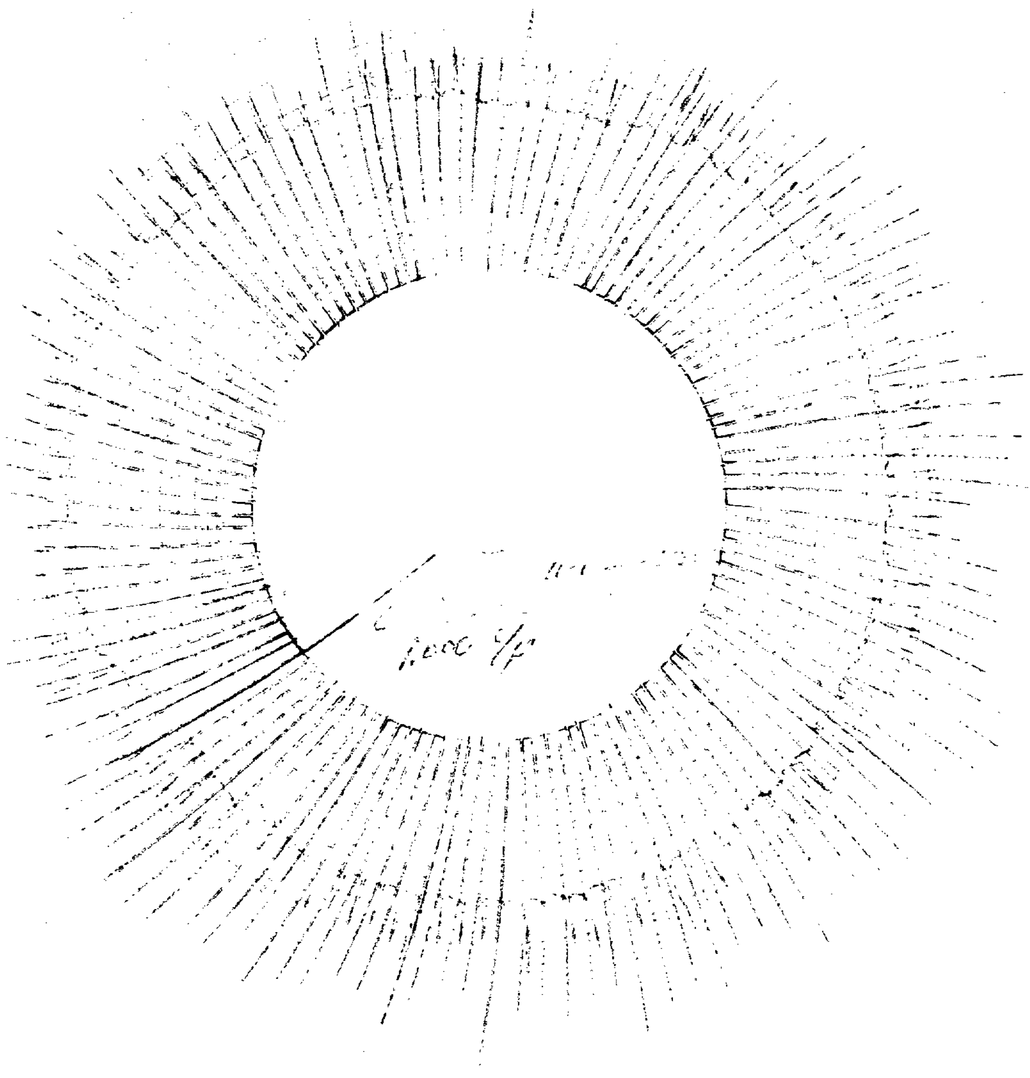

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