GW - 13

REPORTS

YEAR(S):

1995 - 1979

Amoco Exploration And Production
U.S. NGL Business Unit
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

G. D. Henry
Manager, Environment, Health & Safety
U.S. NGL Business Unit

May 17, 1995

Mr. Roger Anderson
Environmental Bureau Chief
Oil Conservation Division
Energy, Minerals and Natural Resources Department
2040 South PaCheco Street
Santa Fe, New Mexico 87505

Dear Mr. Anderson:

Evaporation Pit
Burton Flats Gas Plant

Amoco has now completed the in-place closure of the evaporation pit at the Burton Flats Gas Plant located in Eddy County, New Mexico. The closure was done in accordance with our submitted plan dated March 30, 1995 and approved by the Oil Conservation Division (OCD) on April 14, 1995. The same plan was also submitted and approved by the Bureau of Land Management.

Attached is a copy of the closure report, photographs and field notes related to the pit closure. A copy of the report has also been sent to the OCD office in Artesia. Please reply if you concur that we have satisfied our requirements for closure. If you have any additional questions, please contact Scott Neumann at (713) 366-2501.

Sincerely,

G.D. Henry
dm

SNN/clz

Attachment

cc: Artesia OCD

ENTRIX, Inc.
5252 Westchester Suite 250
Houston TX 77005
713) 666-6223
713) 666-6227 Fax

May 12, 1995

Mr. Scott Neumann
Amoco Production Company
501 WestLake Park Boulevard
Houston, Texas 77253-3092

Re: Burton Flats Gasoline Plant Overflow/Evaporation Pit Closure
Carlsbad, New Mexico
ENTRIX Project No. 146706

Dear Mr. Neumann:

The closure approach, as recommended in the ENTRIX letter dated 3/23/95, was implemented in final closure proceedings conducted on May 1 and 2, 1995, at Amoco Production Company's Burton Flats facility. Mr. Ron Brinkley, of ENTRIX, worked with Mr. David Crawford and your on-site contractors in a coordinated effort to complete the closure project in a proper and expeditious manner. Mr. Ray Smith, representing the State of New Mexico (Oil Conservation Division), visited the project site on day one of the closure activities and expressed to Mr. Brinkley his satisfaction with the extent and manner to which the project had progressed in accordance with the agreed upon closure measures.

The in-place closure of the pit was a practical approach to meeting specified closure guidelines while addressing existing site conditions and environmental concerns relative to this particular project. The final closure of the pit included the following:

1. The existing 6 to 7 foot layer of hydrocarbon-affected subsurface soil (clay) was kept in-place and left undisturbed with the exception of the previous activity involving the excavation of the sampling hole to a depth of 20 feet below grade. Clean backfill was placed in the approximate 4 to 6 foot deep sampling hole at the bottom of the pit. Backfilling in this area continued with the placement of the old liner and clean on-site fill material, followed by disposal and subsequent covering of the old liner with additional clean backfill to cap the hole evenly with the existing bottom elevation of the surrounding pit.

2. The existing 2 foot layer of unimpacted clay overlying the 6 to 7 foot layer of hydrocarbon-affected subsurface soil was also kept in-place and served as a stable foundation for the overlying center mound that was created.

3. Prior to the installation of the new pit liner, the center mound was created using backfill from the former on-site hydrocarbon remediation area. The accepted use of this material as backfill was consistent with the recommended in-place closure of the pit. This backfill material consisted of hydrocarbon-affected soils, in addition to a few inches of unaffected soils. Development of the center mound was closely monitored to further ensure maximum use of the available space within the pit and soil remediation material, as a means of adequate on-site disposal while achieving the purposeful shedding effect of the mound and overlying liner to lessen the potential of further hydrocarbon migration. The backfill material was thoroughly packed within the pit bottom and the base perimeter was trenched prior to the final center mound shaping and in preparation for the liner installation. Upon completion of the center mound, a transit was used to determine if the below grade integrity of the resulting peak elevation was acceptable. A prior decision on the matter established an elevation of 1 foot below grade as the maximum acceptable height of the center mound. The elevation of the center mound was determined to be 1′ 3″ below grade and adequate in regards to desired elevation. The domed area was carefully searched for debris that could penetrate the liner. The contractors were then instructed to place the 20-mil thick synthetic liner over the mounded backfill and underlying soils.

4. Careful positioning of the liner over the center mound facilitated the trimming of excess material from two sides of the 60 by 60 foot sheet of liner. The liner was trimmed in such a manner as to allow for overlap up the sidewalls of the pit to a point at or near the level of the center mound peak. Clean fill material from a nearby on-site stockpile was used to anchor the liner in preparation for further filling. All remaining berms around the perimeter of the pit were contoured from relative grade to approximately 1 foot above grade as a basis for the formation of the final cap. The excess soils resulting from the contouring activity were subsequently pushed into the pit as supplemental fill. As the filling of the pit continued, caution was taken to maintain the integrity of the liner as the remainder of the on-site stockpiles of clean fill were pushed into the pit. As with the center mound, an elevation on the desired final peak of the cap was determined to be 2

feet above grade. Additional fill was brought in from an off-site source to complete the final cap to the pre-determined elevation.

5. As the last load of off-site fill was being spread over the pit area, the contour, shape, and elevation of the final cap were considered to facilitate drainage away from the former pit area. In utilizing all of the available fill material, a final cap peak elevation of 2′ 3″ above grade was achieved.

The execution of the closure plan developed for this Amoco project was successful in terms of understanding and fulfilling your company's needs, in addition to valued coordination and individual effort required to complete the project. ENTRIX would like to thank you for this opportunity to further our relationship and look forward to working with Amoco on future projects. Please call me at 666-6223 if you have any questions or require additional information.

Very truly yours,

Todd M. Williams, P.E., P.G.
Principal Consultant

Attachments

Burton Flats Gasoline Plant Overflow/Evaporation Pit Closure

Field Notes taken by Ron Brinkley

ENTRIX Project No. 146706

NOTE: All time posted in Mountain Standard Time.

5/1/95

1205-Ron Brinkley (RB) arrives at the Amoco/Burton Flats project site. RB is met by David Crawford (DC), site supervisor/environmental health and safety coordinator/Amoco Production Company. RB is briefed on the site activities since work began at 0700. The contractors are currently idle because their front end loader (FEL) ran out of fuel.

NOTE: (Contractor information)

Name of contractor	Flint Engineering & Construction Company
Mailing address	P.O. Box 1267 Levelland, TX 79336
Physical address	1599 West Farm Rd. 300 Levelland, TX 79336
Contact numbers	Office (806) 894-8055 Fax (806) 8947847 Mobile (806) 638-6499
Contact name	Don Hiett, Project Superintendent

1215-Contractors/Manuel and Robert (C/M,R collectively, or C/M and C/R individually) depart the immediate project site to use the telephone at the plant office to order more diesel fuel. RB and DC continue their discussion of the pit closure and review pertinent documents brought on-site by RB. DC explains the on-site soil remediation (S/R) effort for treating hydrocarbon contaminated soils removed from the bottom of the pit. Much of the material being remediated was lying between two old pit liners that were removed. Additional contamination extended beneath the liners into the underlying soils. DC further explains that the remediation process has not been very successful due to the lack of moisture, a limiting factor in the biodegradation process. DC states that no significant change in total hydrocarbons has been detected. RB questions DC about the use of the S/R material as backfill. DC explains the approval process involving Scott Neumann (SN) of Amoco, and the State of New Mexico. DC states that he has taken numerous photos of the site activities and will be providing ENTRIX with prints.

1230-C/M returns to the immediate site and states to RB that the diesel fuel will be delivered in approximately one hour. The fuel is being brought from a nearby Flint job site by a co-worker. DC and RB discuss the center mound formation using the S/R material, liner installation, and capping of the pit using clean on-site and off-site fill material. DC states his plans to depart the project site soon. RB asks DC to wait until he (RB) talks with Todd Williams (TW) about a few matters before departing. Specifically, the use of the S/R material as backfill and the anticipated below grade elevation of the center

mound peak/liner. The recommended closure approach addressed in TW's letter to SN dated 3/23/95, does not specify either of the matters of concern.

1250-DC and RB depart the immediate project site to use the telephone at the plant office to contact TW.

1255-RB contacts TW and they discuss the matters of concern (as noted in the 1230 field entry). TW states that the S/R material can be used as backfill if SN had approval from the State of New Mexico. The matter of using the contaminated material as backfill was proposed by SN after the closure procedure was written. TW states he would like to have an update from RB the following morning.

1317-DC departs the project site en route to Midland. Prior to his departure, he requested RB to provide the ENTRIX report on the pit closure by 5/10. DC intends to have the two rolls of film he took on the days activities developed in hopes of providing RB with prints upon his return to the site around 1700 on the following day. DC states he has a meeting in Midland in the morning.

1330-C/M,R are still awaiting delivery of the diesel fuel.

1350-Ray Smith (RS), Field Representative/State of New Mexico, arrives at the project site. RB greets RS and briefs him on the closure activities of the day. Further topics of discussion include: the use of the S/R material as backfill, remaining closure activities, and forthcoming state orders requiring closure of all existing pits and subsequent construction of replacement aboveground concrete dikes.

1405-RS requests RB to contact him if anything unusual occurs concerning the pit closure. RS can be contacted at (505) 748-1283/office, or (505) 746-3753/home. RS states his intent to check on the project at a later date and departs the project site. C/M relocates an on-site track hoe (TH) along side the FEL to facilitate a fuel transfer to further site operations.

NOTE:

> P/# - indicates a photo taken in the numbered sequence, followed by a description of the photo subject.
>
> P/#/Pan - indicates the corresponding photo was taken with a disposable Kodak Panoramic 35 camera. All other photos were taken with a disposable Kodak FunSaver 35 camera.

1410-P/1/Pan depicts the monitor well #1's (MW-1) aboveground structure.

1415-P/2/Pan depicts the open pit after the 10' deep observation trench is filled, but prior to any actual backfilling/filling of the pit proper. C/R is questioned about the material used to fill the observation trench. C/R states that the old pit liners and clean fill from an on-site source were used. The old liners were sandwiched between underlying/overlying layers of the clean fill material.

1420-RB documents the existing site conditions.

1425-P/3/Pan depicts stockpiled material resulting from scraping activity at the 75'x 90' section (S/R-1) of the S/R area. The mound is comprised of contaminated material removed from the bottom of the pit and a few inches of the underlying soils. The removal of the underlying soils is a precautionary measure to lessen any remaining on-site contamination after final site clean up.

1427-C/M,R start the FEL after transferring approximately 15 gallons of diesel from the TH. The FEL engine is then shut down and additional diesel is transferred.

1432-P/4/Pan depicts stockpiled material resulting from partial scraping activity at the 45' x 120' section (S/R-2) of the S/R area. C/M,R continue to transfer diesel fuel from the TH to the FEL using a siphon hose and a 5-gallon bucket.

1435-P/5/Pan depicts on-site stockpiles of top soil and crushed limestone to be used as clean fill. The top soil was brought in from an off-site source, whereas the crushed limestone originated from a prior plant pipeline installation project. C/M,R continue to transfer diesel fuel to the TH.

1446-C/M,R resume site operations utilizing the FEL. C/M is the principle equipment operator. The S/R-1 material is being placed in the pit.

1452-P/6/Pan depicts the FEL dumping a bucket of S/R-1 material in the pit.

1457-P/7 also depicts the FEL dumping a bucket of S/R-1 material in the pit.

1459-P/8 depicts a remaining portion of the earthen berm at the former evaporation pit used heightening and liner anchoring. The remaining berm and footing will be graded to an elevation of 1' above grade in preparation for the formation of the final pit cap.

1510-The diesel fuel delivery arrives at the project site via a Flint vehicle/worker. Fueling of the FEL begins. Approximately 70 to 80 gallons of the 100 gallons delivered will fill the FEL. C/R states that approximately 25 gallons of diesel was transferred from the TH to the FEL. The remaining fuel will replace the diesel taken from the TH.

1515-RB meets Jack Hobbs (JH), plant operator for Amoco, at the immediate project site. JH informs RB and C/M,R that he is leaving for the day and gives instructions to lock the gate upon final departure. JH further advises that the plant office will be locked and there will be no telephone access. Placement of the S/R-1 material into the pit is completed and C/M begins scraping the S/R-2 material.

1523-P/9 depicts scraping activity in the S/R-2 area.

1535-RB instructs C/M to use the FEL to pack-in the S/R backfill before determining if enough material has been placed in the pit to achieve the desired mound elevation after shaping.

1542-P/10 depicts the FEL packing the pit bottom.

1546-Packing operations are completed and C/M resumes scraping of the S/R-2 material.

1600-C/M asks RB if site operations can be ended for the day since they left their HQ in the early morning. RB halts site operations. C/M,R and RB agree to resume operations at 0700 the following morning.

1615-RB and C/M,R depart the project site en route to Carlsbad lodging.

1635-RB arrives at Stevens' Best Western lodging in Carlsbad.

5/2/95

0637-RB departs lodging en route to the Amoco/Burton Flats project site.

0705-RB arrives at the plant gate. C/M,R have been waiting at the locked gate since 0630.

0715-JH arrives at the plant and unlocks the gate.

0730-DC and Don Hiett (DH) arrive at the project site. RB, DC, and DH discuss the amount of backfill presently in the pit and decide on the desired mound elevation of 1' below grade. All are in consensus that enough backfill has been placed in the pit and the center mound formation should begin. RB asks DH if he has a transit that can be used in determining final elevations. DH states he will have to go to another job site to get a transit.

0735-C/M is instructed by DC to use the FEL to smooth/level out the bottom of the pit in preparation for formation of the center mound.

0745-C/M uses the TH from atop the pit perimeter to trench around the bottom of the pit while depositing the resulting material toward the center of the pit to create the mound. An evaluation will be made after trenching is complete to determine if additional material will be needed to achieve the desired elevation of the mound peak/liner.

0800-Trenching activity continues. P/11 and P/12 depict the trenching activity.

0815-Trenching of the pit bottom is completed. P/13 depicts the resulting mound before final shaping. DH has departed the project site to get a transit for verifying the elevations.

0825-C/M completes the shaping of the center mound using the TH. P/13 depicts the mound. DC departs the immediate site and goes to the plant office.

0840-RB and C/R physically work the mound searching for concrete, metal, and wood debris that could possibly puncture the liner when placed, while further shaping the mound with their feet. Several pieces of debris are found and removed.

0845-DH returns to the project site with a transit. MW-1 is used as a benchmark and marked at 3' 6", an equivalent of 100 (relevant elevation).

0853-An elevation is taken at the center peak of the mound and marked at 4' 9", or 1' 3" below grade. RB and DH are satisfied with the current elevation of the center mound peak. RB will inform DC of the elevation upon his return to the immediate project site. C/M uses the FEL to scrape up remaining material in the S/R-2 area. All final material cleaned up in the S/R-1,2 areas will be taken to Eunice for final disposal at an EP waste facility. P/14 depicts final scraping activity and stockpiling of the S/R-2 material. DH departs the immediate project site to talk with DC at the plant office.

0900-RB completes a final inspection of the center mound prior to the liner installation. DC and DH return to the immediate project site. DH instructs C/R to assist him in measuring the bottom of the pit at the base of the center mound to determine how much excess liner there will be. The bottom measurements are 46' x 46'. The liner is 60' x 60' and will be cut to size once placed within the pit over the center mound.

0905-All hands assist in pulling the liner into the pit. P/15 depicts the liner being spread out over the center mound and positioned in preparation for anchoring.

0908-P/16/Pan depicts the final liner positioning.

0910-C/M places the first bucket to clean fill taken from the on-site stockpile of top soil to anchor the liner. P/17 depicts the clean fill being placed as an anchor.

0915-C/M continues to use the FEL and top soil to anchor the liner. RB, DC, and DH discuss the final elevation of the pit cap. A final cap elevation of 2' above grade is decided on to provide adequate protection of the underlying liner. P/18 depicts the advanced anchoring activity. C/R is observed trimming the excess liner from two of the liner edges.

0920-P/19 depicts the liner trimming operations.

0925-DC asks RB how he would proceed with the capping of the pit. DC does not want the equipment to impact the liner integrity. RB suggests to begin by using the FEL to contour the remaining earthen dike/footing (considered clean fill) from "zero" to an approximate 1' above grade. The resulting material can be pushed into the pit from around the edges. After the perimeter is dressed to the desired contour, additional fill material can be placed from around the edge in a like manner while working toward the center of the pit. DC agrees to the suggested filling approach.

0930-DH orders additional clean fill material. DH states to RB that the fill material he ordered is New Mexico top soil. Trimming of the liner is complete.

0938-P/20 depicts the dike/footing at 1' above grade. The resulting material is being pushed into the pit.

0943-P/21/Pan depicts the FEL placing clean fill from the on-site stockpile of crushed limestone into the remaining pit area. DC had decided to use the crushed limestone directly over the pit liner rather than waiting for delivery of the off-site top soil fill material.

0953-P/22 depicts continued fill operations using the on-site stockpile of crushed limestone.

0957-RB and DC depart the immediate project site to use the plant office telephone to contact TW.

1003-RB contacts TW with an update. DC is present. The following topics are briefly discussed:

Final liner elevation of 1' below grade;
Cap elevation targeted at 2' above grade;
ENTRIX letter to Amoco, point by point; and
Photo documentation.

1015-RB returns to the immediate project site. DC remains at the plant office. The liner has been completely covered with all of the on-site clean fill material.

1022-P/23 depicts the crushed limestone in the center area covering the mound peak/liner.

1023-Truck #1 arrives at the immediate project site with 21.86 tons of fill material. The truck driver states the load is approximately 20 cu. yds. of material. P/24 depicts the truck dumping the load of topsoil and the FEL working on the cap. The cap is currently at approximately 1' above grade.

1038-DH sets up the transit to take an elevation at the cap.

1042-The elevation at the cap center is determined to be 1' 7" above grade, slightly short of the desired 2' elevation.

1045-Truck #2 arrives with more fill material (amount not noted). Truck #1 is being loaded with the S/R-2 material for off-site disposal. Truck #2 dumps its load.

1050-Truck #2 is positioned for loading with the S/R-2 material. Truck #1 is departing the immediate project site to wait at the plant office for the necessary manifest papers.

1058-C/M uses the FEL to spread the fill material over the pit to begin forming the cap.

1108-C/M completes the spread of the fill from Truck #2. RB notes that additional fill material will be required.

1110-DH takes another elevation at the cap. The elevation is still at 1′ 7″ above grade. The second load of fill did not bring up the elevation, but served to round out the cap on all sides.

1115-C/M,R break for lunch. C/M states that another load of fill should arrive in approximately thirty minutes per DH.

1122-A Flint lowboy arrives at the immediate project site to pick up the TH.

1130-RB questions DH about the availability of the transit for final elevations. RB is concerned because DH has indicated he will be departing the project site soon and does not plan to return. DH states he will be taking the transit with him and suggest a stake be driven in the center of the cap marking the 2′ elevation point. The FEL can work around the stake.

1140-RB locates the center of the cap and DH instructs C/R to drive a short metal stake into the cap. DH then uses the transit to position the top of the stake at the desired elevation of 2′ above grade. The top of the stake is 5″ above the current cap, indicating the amount of fill required to reach the 2′elevation. P/25 depicts the stake at the center of the cap. DC returns to the immediate site. DC,DH, and RB discuss the additional fill being brought. RB assures DC the incoming fill will be enough to complete the project. DH and C/R depart the plant site. DC asks RB to oversee the loading of the S/R-2 material as the trucks arrive and to assist with completing the manifest until JH returns to the plant office. DC asks RB to go to the plant office with him for final instructions on completing the manifest forms and to get directions to give to the truck drivers on where to go near Eunice.

1148-JH arrives at the plant office and DC briefs him on the manifest and directions to the disposal site. RB returns to the immediate project site.

1208-The TH is loaded on the lowboy and departs the plant site. Truck #3 arrives at the immediate project site with 29.72 tons of fill material. The truck driver states the load is approximately 23 cu. yds. of material. P/26 depicts the dumping of the fill onto the cap. RB observes DC departing the plant site.

1215-C/M uses the FEL to spread the fill material while continuing to shape the cap. Truck #3 does not have any tarps. JH arrives at the immediate site with manifest papers for the driver to complete. RB explains that the truck does not have any tarping capability and cannot be loaded with the S/R-2 material. JH concurs and Truck #3 departs the plant site empty. An individual named Mario, representing the trucking company, has arrived at the immediate project site and indicates to RB that the last two loads of fill material have been ordered and are en route. He further indicates that the trucks do not have tarping capability and cannot be used to haul the S/R-2 material. Mario states that Truck #s 1 and 2 will be returning to the site to pick up a second load each of the S/R material.

1230-C/M has completed the spreading/smoothing of the cap using the fill from Truck #3.

1300-Still awaiting the arrival of the last two trucks.

1315-C/M is briefed by RB on where to place the final fill material in the event the trucks arrive before he returns from lunch. RB informs JH of the truck situation. RB departs the plant site.

1350-RB returns to the immediate site. C/M indicates to RB that the two trucks arrived around 1325. C/M is completing the final shaping of the cap with the FEL.

1400-C/M completes the spreading of the fill material and RB conducts a final inspection of the cap. RB notes that the metal stake is approximately 3″ below the top of the cap peak. C/M is instructed by RB to pull the stake and to dress the immediate peak of the cap with the FEL.

1410-RB declares the pit closure completed. P/27 depicts the final project. RB remains on-site to finalize his field notes.

1430-RB departs the immediate project site to go to the plant office to talk with JH. RB and JH discuss the remaining S/R material. RB is satisfied that JH understands all of the concerns DC had expressed concerning the handling of the S/R material and off-site disposal.

1510-RB departs the plant office and returns to the immediate project site to let C/M know of his intent to depart the plant site. C/M asks about the time line for the trucks coming to pick up the S/R-2 material. RB suggests he discuss the matter with JH.

1515-RB departs the plant site.

Burton Flats Gasoline Overflow/Evaporation Pit Closure

ENTRIX Project No. 146706

Photo Documentation as referenced in Field Notes taken by Ron Brinkley

5/1/95

P/1/Pan	Monitor well #1's aboveground structure and project site.
P/2/Pan	Open pit after the 10' deep sampling hole is filled.
P/3/Pan	Stockpiled material resulting from scraping activity at the 75' x 90' section (S/R-1) of the former soil remediation area.
P/4/Pan	Stockpiled material resulting from partial scraping activity at the 45' x 120' section (S/R-2) of the former soil remediation area.
P/5/Pan	On-site stockpiles of top soil and crushed limestone to be used as clean fill.
P/6/Pan	Front end loader dumping a bucket of S/R-1 material in the pit.
P/7	Front end loader dumping a bucket of S/R-1 material in the pit.
P/8	Remaining portion of the berm at the former evaporation pit used for heightening and liner anchoring.
P/9	Scraping activity in the S/R-2 area.
P/10	Front end loader packing the pit bottom.

5/2/95

P/11	Trenching activity in pit for center mound development and in preparation for liner installation.
P/12	Trench resulting from center mound development and in preparation for liner installation.
P/13	Center mound before final shaping.
P/14	Final scraping and stockpiling activity of the S/R-2 material.
P/15	Pit liner being spread out over the center mound and positioned for anchoring.
P/16/Pan	Final liner positioning.
P/17	Clean fill being placed on liner as an anchor.
P/18/Pan	Advanced anchoring of liner.
P/19	Trimming of excess liner.

P/20	Former dike scraped to 1′ above grade as final cap footing/development.
P/21/Pan	Front end loader placing clean fill from the on-site stockpile into the remaining pit area.
P/22	Continued fill operations using the on-site stockpile of crushed limestone.
P/23	Crushed limestone in the center area of the pit covering the mound peak/liner.
P/24	Truck dumping a load of topsoil on the cap.
P/25	Cap after stake is placed marking the desired 2′ elevation.
P/26	Dumping of fill onto the cap. Note stake at workers feet.
P/27	Final project as completed.

1 (P7)

2 (P13)

BURTON FLATS
GAS PLANT
PIT CLOSURE
PROJECT - MAY 95

3 (P22)

4 (P25)

Amoco Production Company
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

March 30, 1995

Mr. Roger Anderson
Environmental Bureau Chief
Oil Conservation Division
Energy, Minerals and Natural Resources Department
2040 South PaCheco Street
Santa Fe, New Mexico 87505

Dear Mr. Anderson:

Evaporation Pit
Burton Flats Gas Plant

On September 25, 1994, Amoco Production Company received a letter from the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division granting permission for temporary onsite bioremediation of contaminated soils at the Burton Flats Gas Plant. The soils to be remediated included soils from various areas across the plant as well as from the abandon evaporation pit should contamination be found under the pit liner.

On March 9, 1995, the liner from the pit was pulled back and contaminated soils were observed. It appears that the majority of the contamination may have been caused by a once unlined pit at the site. Since contamination was observed under the liner, we have based our pit closure recommendation on the NMOCD Unlined Surface Impound Closure Guidelines.

Based on all the data, we are recommending leaving the pit in place and covering it with an impermeable cap. All of the information available suggests that this is the most effective option for closing the pit.

The attached information explains why we have chosen to pursue the capping option. We are prepared to move ahead with this project as soon as OCD approval is granted. If you have any additional questions, please contact Scott Neumann at (713) 366-2501.

Yours truly,

G. D. Henry
Manager, Environment, Health & Safety
Natural Gas Liquids Business Unit

SNN/clz

ENTRIX, Inc.
7252 Westchester Suite 250
[illegible]
[illegible]
[illegible]

March 23, 1995

Mr. Scott Neumann
Amoco Production Company
501 WestLake Park Boulevard
WestLake III, Room 1760
Houston, Texas 77253-3092

Re: Burton Flats Gasoline Plant Overflow/Evaporation Pit Closure
Carlsbad, New Mexico
ENTRIX Project No. 146706

Dear Mr. Neumann:

ENTRIX, Inc. has prepared this letter for Amoco Production Company to present justification and a recommended approach for termination of remedial action and final closure of a former overflow/evaporation pit at the Burton Flats Gasoline Plant located near Carlsbad, New Mexico. The approach has been developed based primarily upon the existing site data/conditions and the Unlined Surface Impoundment Closure Guidelines established by the New Mexico Oil Conservation Division dated February 1993.

INTRODUCTION

Amoco Production Company has owned and operated the Burton Flats Gasoline Plant located near Carlsbad, New Mexico since 1993. The plant was constructed in 1977. The overflow/evaporation pit (approximately 60' x 60' x 10') received a variety of gasoline plant and production liquids resulting from plant upsets. A new liner was installed by the former operators in 1987 at a depth of approximately 10 feet below grade. The location of the pit is presented on Attachment 1.

During the initial phases of the original pit closure in early March 1995, Amoco discovered that the liner had leaked. Approximately 3 inches of hydrocarbon affected soils were discovered underlying the liner. Based on this finding, Amoco utilized a backhoe to excavate soils from the bottom of the pit (approximately 10 feet below grade) to a depth of 20 feet below grade to determine the extent of the affected soils. Data from three monitor wells (installed in February 1993) were also included to determine the depth of and potential affects to the shallow groundwater from plant operations. Details of these findings are presented below in the Summary of Existing Site Data section.

Based on the existing site conditions, sample analytical data, and evaluation of potential future impacts, ENTRIX recommends an in-place closure of the remaining hydrocarbon affected soils located at depth underlying the former pit location. The following sections describe the existing site data, evaluation of future hydrocarbon migration potential, and justification for termination of remedial action and in-place closure of the remaining hydrocarbon-affected subsurface soils.

PHYSICAL SETTING

The gasoline plant is located in Eddy County, approximately 10 miles northeast of Carlsbad, New Mexico. The nearest permanent residences are located more than 5 miles from the plant. The nearest surface water body, Avalon Reservoir, is located approximately 8 miles southwest of the plant. Based on published reports, the nearest known private water well is located 2 miles southwest of the plant. According to the Geology and Ground-water Resources of Eddy County, New Mexico (Groundwater Report 3 dated 1952) published by the State Bureau of Mines and Mineral Resources, both surface water and groundwater flows generally to the southwest. The average annual precipitation in the Carlsbad Area is 12 inches. Based on climactic conditions in the region, the majority of the rainfall is reportedly lost to evaporation and transpiration before reaching any groundwater tables.

The plant appears to be underlain by the Rustler Formation, ranging in thickness from 200 to 500 feet, and consists of anhydride, gypsum, interbedded red and green clay and some dolomite according to the Ground-Water Report 3. According to this report, groundwater in this area is generally obtainable at depths of less than 250 feet though "generally impotable and locally unfit for livestock". Detailed information regarding site specific geologic and hydrogeologic conditions are provided below.

SUMMARY OF EXISTING SITE DATA

Soils

The initial closure activities of the pit included the removal of the material located above the liner down to a depth of approximately 10 feet below grade. The liner was subsequently removed at which time hydrocarbon stained soils were encountered. One sample of this stained soil was collected. In addition, soil samples were collected at depths of 10 feet below grade (the depth of the bottom of the pit) to approximately 20 feet below grade. These soil samples were submitted for Total Petroleum Hydrocarbons (TPH) and benzene, toluene, ethylbezene and xylene (BTEX) analysis. The sampling locations and sample analytical results are presented on the attached Figure 1.

The soils underlying the liner, to a depth of 20 feet below grade, consist of clay with some gypsum. Based upon the soil samples, it appears that a 2 foot thick layer (10 to 12 feet below grade) of clean clay was placed immediately below the liner when it was installed by the former operators in 1987. Though the liner leaked, it apparently only impacted the top few inches of the 2 foot clay layer since staining was not observed throughout the entire thickness. Stained soils were again observed immediately below the 2 foot thick clay layer (depth of 12 feet below grade) to a depth of 18 feet below grade. Samples were collected at depths of 10, 13, 18 and 20 feet below grade and submitted for analysis.

The results of these sample analysis indicated that elevated concentrations (with respect to OCD remediation level guidelines) of TPH were detected to a depth of approximately 18 feet below grade. Benzene was detected but not at elevated concentrations. The sample collected at 20 feet below grade exhibited non-detect levels of TPH and very low concentrations of BTEX (Attachment 2).

Groundwater

In February 1993, Amoco installed three groundwater monitor wells at the plant to determine if the shallow groundwater had been impacted by plant operations. Well MW-1 was installed adjacent to and immediately downgradient of the pit and MW-2 and MW-3 were installed approximately 300 feet downgradient from the pit. The well depths are 40 feet (MW-1), 90 feet (MW-2) and 20 feet (MW-3). The drillers logs for each of the borings are presented as Attachment 3. In summary, red clay with some gypsum was encountered from the ground surface to a depth of approximately 65 feet below grade. A sand was encountered from a depth of 65 to 90 feet below grade in well MW-2. Sand was reportedly not encountered during the drilling of MW-1 or MW-3. Groundwater elevations in the wells indicates a general flow direction to the south-southwest.

The basis for the difference in well depths is that first indications of groundwater, or a groundwater-bearing zone, were encountered at different depths during the drilling operation. It was reported that it required at least several hours for measurable amounts of groundwater to accumulate inside the well casing. In addition, the wells are typically bailed dry during sampling events. Based on this information, it appears that the shallow water-bearing zones underlying the plant are not continuous, perched, of low quality and low yield potential. Therefore, the shallow groundwater underlying the plant likely has no present or foreseeable beneficial use.

The three monitor wells have been sampled on five occasions since March 1993. TPH and BTEX has not been detected in any of the groundwater samples collected from these three wells during these sampling events (Attachment 4).

FUTURE HYDROCARBON MIGRATION POTENTIAL

At the present time, the source of hydrocarbons and the liner have been removed from the pit. A 2 foot thick clay layer, apparently unimpacted by hydrocarbons, underlying the former liner has not been removed. Therefore, an approximate 6 to 7 foot thick layer of hydrocarbon-impacted clay, with an overlying 2 foot thick layer of unimpacted clay, currently underlies the pit at a depth of 12 to 19 feet below grade.

Groundwater levels present in MW-1, located adjacent to the pit, have been measured at an average depth of approximately 31 feet below grade.

Groundwater has not been impacted by the hydrocarbons and we do not believe that hydrocarbons have a significant potential for reaching the shallow groundwater for the following reasons:

1. There is at least 12 to 13 feet of unaffected clay separating the hydrocarbon affected subsurface soils from the groundwater table.

2. The hydrocarbon source has been removed from the pit which significantly reduces the driving force for further downward migration of hydrocarbons.

3. A 2 foot thick unaffected clay cap is present directly overlying the hydrocarbon-affected subsurface soils.

4. The annual rainfall is not significant and the evaporation rate is high which results in a low potential for mobilizing hydrocarbon downward into the groundwater table.

Based upon the information presented above, ENTRIX recommends the approach described below for termination of remedial action and final closure of the pit.

RECOMMENDED CLOSURE APPROACH

The recommended closure approach described below is based upon not removing the remaining hydrocarbon-affected soils and completing an in-place closure. We believe that implementing this approach, combined with current site conditions, will not pose a threat to present or foreseeable beneficial use of water, public health and the environment in the surrounding area. The recommended approach for final closure of the pit includes the following:

1. The existing 6 to 7 foot layer of hydrocarbon-affected subsurface soil (clay) will remain in place.

2. The existing 2 foot layer of unimpacted clay overlying the 6 to 7 foot layer of hydrocarbon-affected soil will remain in place.

3. A 20-mil thick synthetic liner will be placed over the 2 foot thick layer of unimpacted clay and mounded backfill (see Figure 1).

4. The synthetic liner will be covered with backfill consisting of soil from the pit sidewalls and dike and supplemented with additional soil backfill from onsite or offsite sources, as necessary.

5. The final grade will be contoured to provide drainage away from the former pit location.

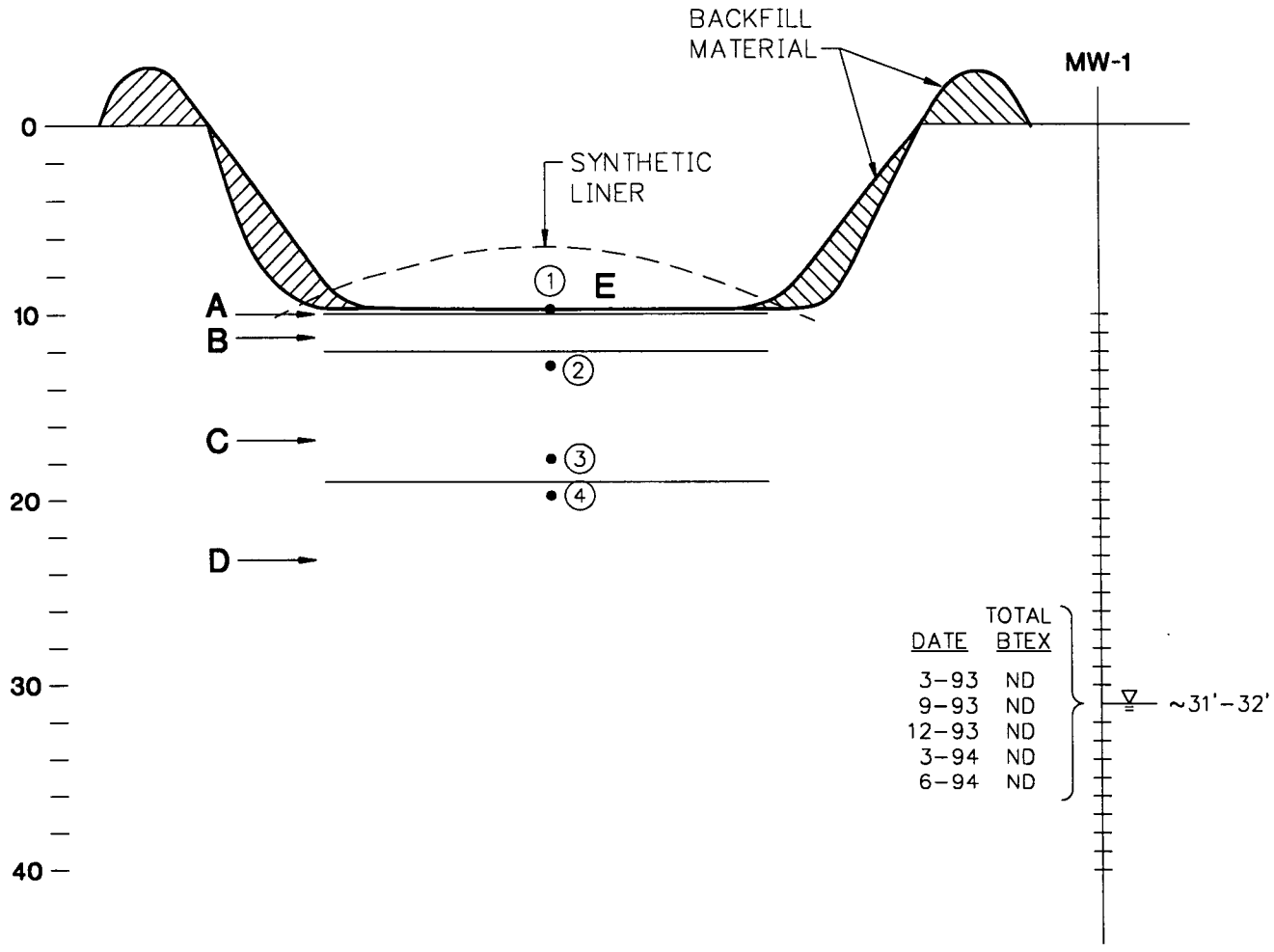
A closure report documenting onsite closure activities will be prepared and submitted to Amoco for review.

ENTRIX appreciates the opportunity to submit this letter to Amoco. Please call me at 666-6223 if you have any questions or require additional information.

Very truly yours,

Todd M. Williams, P.E., P.G.
Principal Consultant

Attachments



LEGEND:

A – 3" CONTAMINATED SOIL UNDER FORMER LINER
B – 2' CLAY (NO STAINING)
C – 7' STAINED SOIL
D – CLEAN SOIL (CLAY)
E – FILL UNDER LINER
• – SAMPLE LOCATIONS

	TPH (mg/kg)	BENZENE (mg/kg)
① – SURFACE	27,567	1.043
② – 3'	4,940	2.341
③ – 8'	8,717	9.232
④ – 10'	<1	0.024

0 10
FEET
APPROXIMATE SCALE

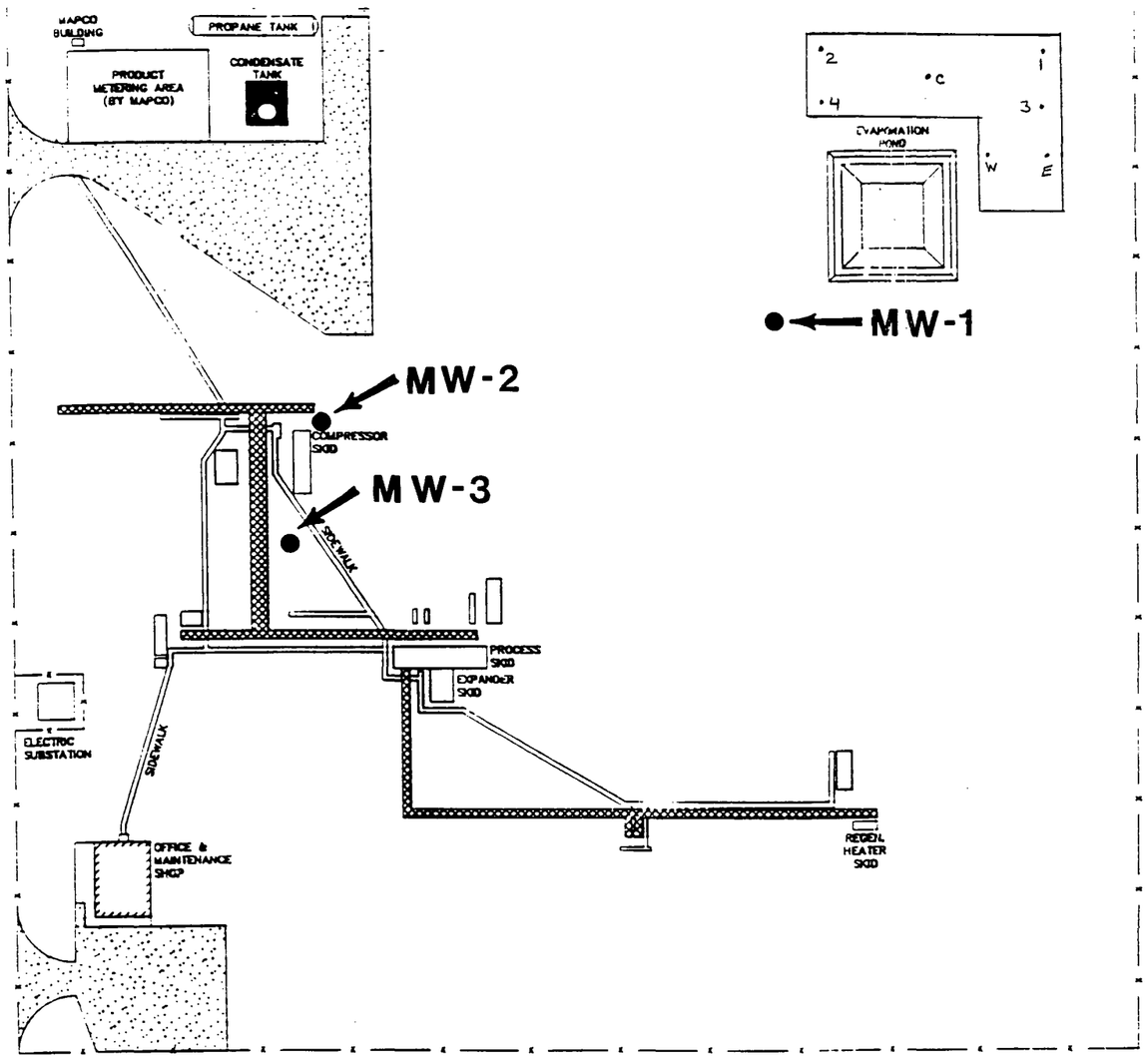
ENTRIX

Figure 1
Amoco Production Company
Burton Flats Gasoline Plant
Evaporation/Overflow Pit

PROJ. NO: 146706	CK:	DATE: 3/95

03/23/95 08:21 TDUNN C:\ACAD\146706\FIG-1

DRAWN BY: LM PITRE 8-12-91
CHECKED BY: DJS 8/13/91
APPROVED BY:
DRAWING NO. 10-1398-89



N

0 feet 80
SCALE

RE: SITE PLAN BY TULSA PRO-QUIP, INC. TITLED "PLOT PLAN BURTON FLATS PLANT" DATED 4-27-77.

ATTACHMENT 1

DATE	NO.	REVISION	BY

Amoco Production Company
Burton Flats Gas Plant
Carlsbad, New Mexico

SITE PLAN

Fig. No.

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

TPH/BTEX ANALYSIS REPORT

Company: Amoco Production Co.
Address: P.O. Box 70
City, State: Artesia, NM 88211

Date: 3/10/95
Lab #: H1984(5-10)

Project Name: not given
Location: not given
Sampled by: DC
Analyzed by: BM, MF
Sample Type: Soil

Date: 3/9/95 Time: not given
Date: 3/10/95 Time: 9:35
Sample Condition: Intact

Units: mg/kg

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL BENZENE	PARA-XYLENE	META-XYLENE	ORTHO-XYLENE
5	Middle Top	27,567	1.043	1.156	0.325	0.432	1.566	0.604
6	North Pit Top	27,579	3.153	1.003	0.510	0.871	3.016	1.030
7	Middle 3'	4,940	2.341	2.881	1.490	2.909	6.252	2.816
8	Middle 8'	8,717	9.232	0.496	3.403	3.241	0.213	0.032
9	Middle 10'	<1	0.024	<0.001	0.007	<0.001	<0.001	0.011
10	Dehy-Mole Sieve	***	<0.001	0.143	0.021	0.015	0.045	0.015
	QC Recovery	425.5	0.995	0.820	0.927	0.909	0.926	0.946
	QC Spike	405.9	0.881	0.868	0.869	0.866	0.860	0.886
	Accuracy	106.8%	112.9%	94.8%	106.7%	105.0%	107.7%	106.8%
	Air Blank	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Methods - GAS CHROMOTOGRAPHY; INFRARED SPECTROSCOPY
- EPA SW-846; 8020, 418.1, 3540 OR 3610

Michael R. Fowler

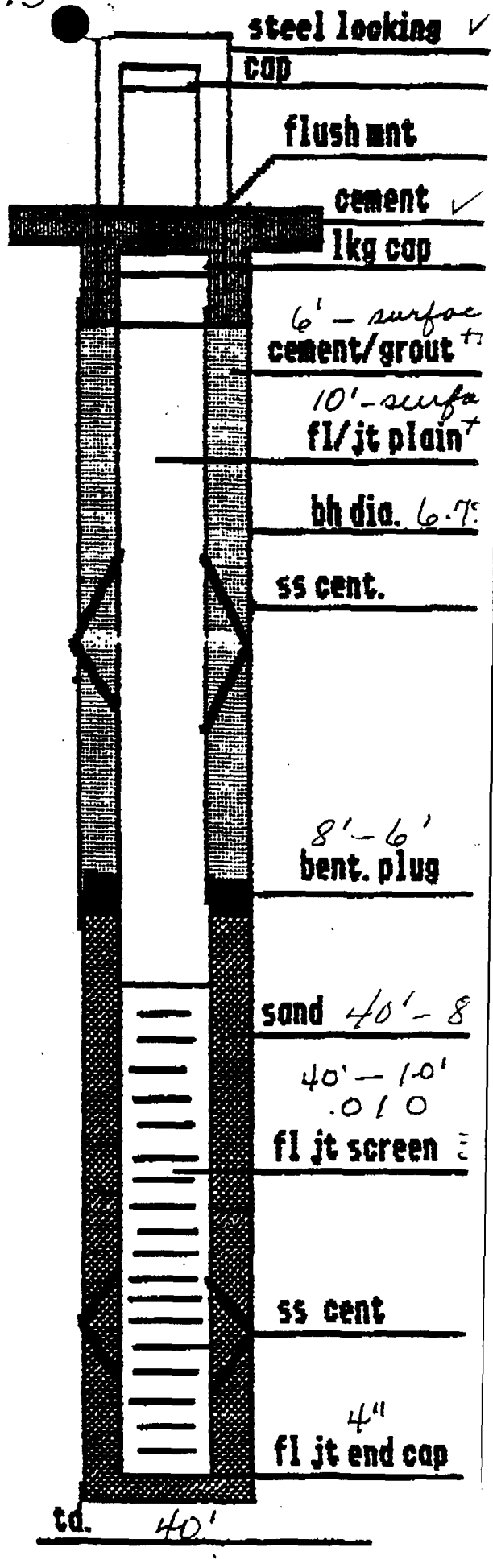
3-10-95
Date

ATTACHMENT 2

CUSTOMER: Amoco DATE: 2-19-93

LOCATION: Barton Flats Gas Plant WELL #: 1

DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM
Topsoil	0	4					1	0
Red clay rock	4	7					5	0
Red clay	7	40					10	0
							15	0
							20	0
							25	0
							30	0
							35	0
							40	0



ATTACHMENT 3

Revised
June 1972

STATE ENGINEER OFFICE
WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address PO BOX 3092

City and State Houston, Texas 77253

Well was drilled under Permit No. MW1-Burton Flats and is located in the :

a. _____ 1/4 _____ 1/4 _____ 1/4 NW 1/4 of Section 14 Township 20S Range 28E N.M.P.M.

b. Tract No. _____ of Map No, _____ of the _____

c. Lot No. _____ of block No. _____ of the _____

Subdivision,recorded in _____ County.

d. X= _____ feet,Y= _____ feet,N.M. Coordinate System _____

Zone inthe _____ Grant

(B) Drilling Contractor Alan Eades Licenee No. WD 1044

Address 1200 E Bender Blvd. Hobbs, NM 88240

Drilling Began 2/18/95 Completed 2/18/95 Type Tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 40 ft.

Completed well is ☒ shallow ☐ artesian Depth to water upon completion of well 16 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
16	40	24	Red Clay	

Section 3. RECORD OF CASING

Diameter (INCHES)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4 3/4	160psi				40		10	40

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____ State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	4	4	TOP SOIL
4	7	3	RED CLAY & ROCK
7	40	33	RED CLAY
			AMOCO-MW1-BURTON FLATS

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Alan Eades
Driller
by Kathy Eades

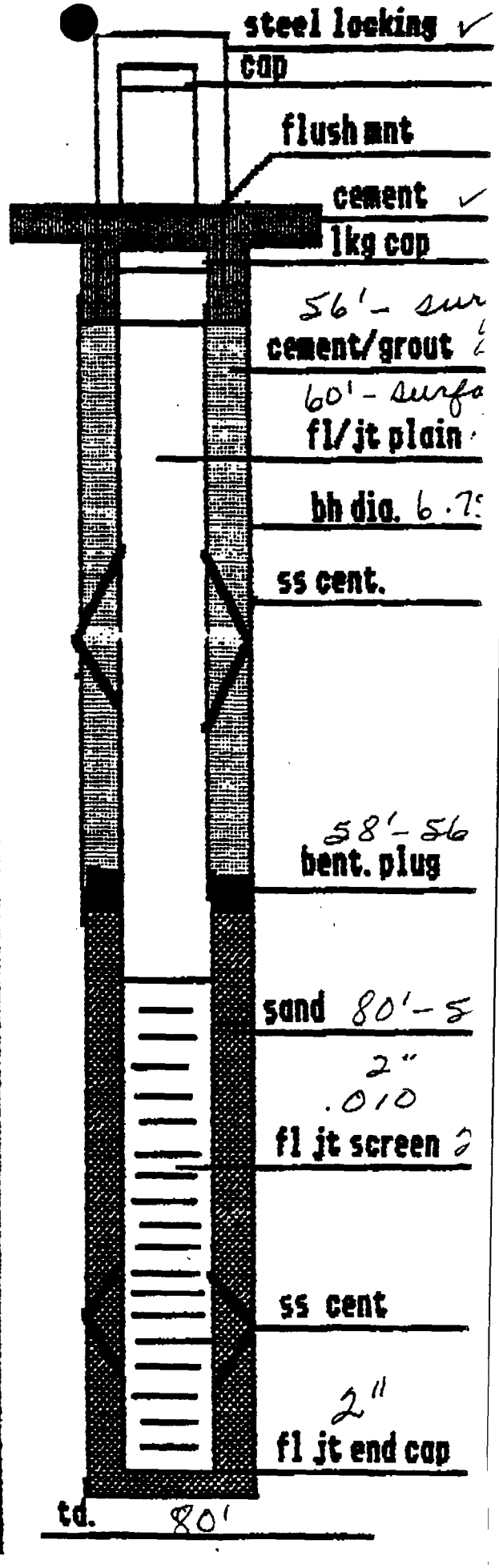
INSTRUCTIONS:

This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

CUSTOMER: Amoco DATE: 2 18-93

LOCATION: BFGP WELL #: 2

DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM
Top soil	0	2					1	0
Red clay w/ crystalized Gypsum	2	14					5	0
Wet red clay	14	19					10	0
Dry red clay	19	35					15	0
Blue clay	35	36					20	0
Red clay	36	64					25	0
Red sand	64	90					60	0
							80	0



Revised
June 1972

STATE ENGINEER OFFICE
WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Duncan Exploration Company Owner's Well No. _____

Street or Post Office Address PO BOX 3092

City and State Houston, Texas 77253

Well was drilled under Permit No. MW2-Burton Flats and is located in the :

a. _____ 1/4 _____ 1/4 _____ 1/4 NW 1/4 of Section 14 Township 20S Range 28E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of block No. _____ of the _____ Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender Blvd. Hobbs, NM 88240

Drilling Began 2/18/93 Completed 2/18/93 Type Tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 80 ft.

Completed well is ☒ shallow ☐ artesian Depth to water upon completion of well 20 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
20	80	60	Blue Clay, Red Clay, Red Sand	

Section 3. RECORD OF CASING

Diameter (INCHES)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type or Shoe	Perforations From	Perforations To
2	sched.80				80		60	80

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by: _____

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

Date Received

FOR USE OF STATE ENGINEER ONLY

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	2	2	TOP SOIL
2	14	12	RED CLAY & CRYSTAL GYPSOM
14	19	5	WET RED CLAY
19	35	16	DRY RED CLAY
35	36	1	BLUE CLAY
36	64	28	RED CLAY
64	80	16	RED SAND
			AMOCO-BURTON FLATS-MW2

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

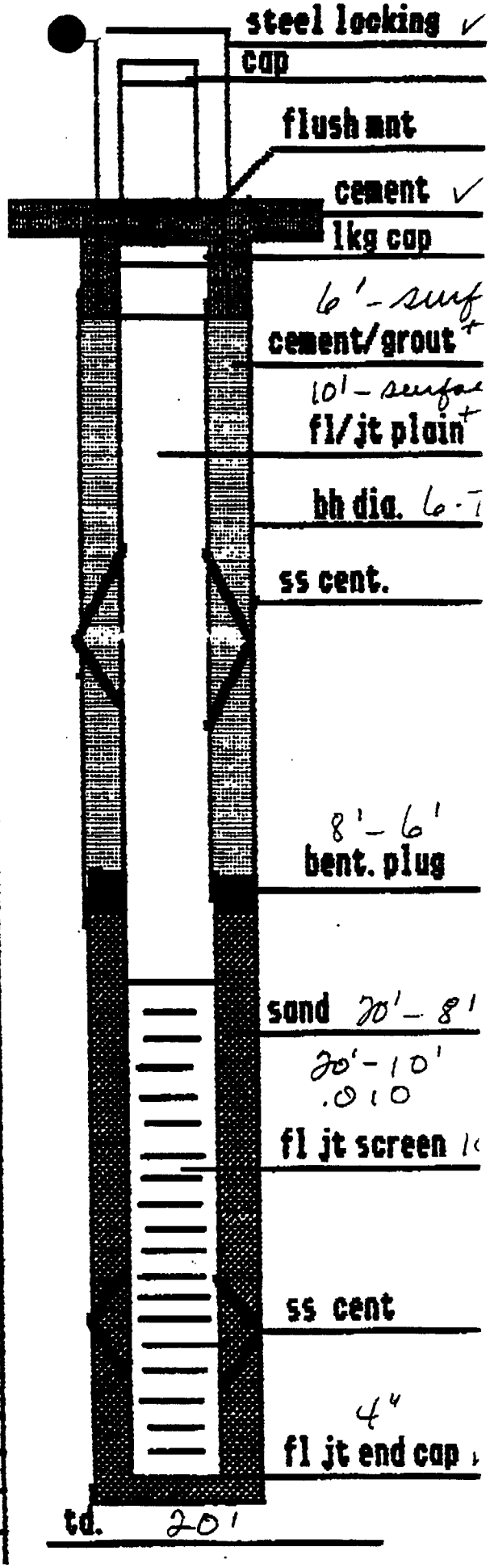
Alan Eades
Driller
by Kathryn Eades

INSTRUCTIONS:

This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 6, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

LOCATION: BFGP WELL #: 3

DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM
Topsoil	0	10					1	0
Red clay/ gypsum	10	13					5	0
Red clay	13	20					10	0
							15	0
							20	0



Revised
June 1972

STATE ENGINEER OFFICE
WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Amoco Production Company Owner's Well No. _____

Street or Post Office Address PO BOX 3092

City and State Houston, Texas 77253

Well was drilled under Permit No. MW3-Burton Flats and is located in the :

a. _____ 1/4 _____ 1/4 _____ 1/4 NW 1/4 of Section 14 Township 20S Range 28E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of block No. _____ of the _____

Subdivision recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____

Zone in the _____ Grant

(B) Drilling Contractor Alan Eades License No. WD-1044

Address 1200 E. Bender Blvd. Hobbs, NM 88240

Drilling Began 2/19/93 Completed 2/19/93 Type Tools Rotary Size of hole 6 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 20 ft.

Completed well is ☒ shallow ☐ artesian Depth to water upon completion of well 20 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
14	20	6	RED CLAY	

Section 3. RECORD OF CASING

Diameter (INCHES)	Pounds per foot	Threads per in	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
4 3/4	160PSI				20		10	20

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor _____

Address _____

Plugging Method _____

Date Well Plugged _____

Plugging approved by:

_____ State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad _____ FWL _____ FSL _____

File No. _____ Use _____ Location No. _____

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	10	10	TOP SOIL
10	13	3	RED CLAY & GYPSOM
13	20	7	RED CLAY
			AMOCO-BURTON FLATS-MW3

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Alan Eades
Driller
By Kathleen Eades

INSTRUCTIONS:

This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

BURTON FLATS GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	1		
TOTAL DEPTH OF WELL:	43	TOP OF SCREEN:	13
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	43

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX
3/2/93		ND	ND	ND	ND	ND
9/23/93	33	ND	ND	ND	ND	ND
12/8/93	36.30	ND	ND	ND	ND	ND
3/15/94	33.86	ND	ND	ND	ND	ND
6/21/94	33.88	ND	ND	ND	ND	ND

ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

ATTACHMENT 4

BURTON FLATS GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	2		
TOTAL DEPTH OF WELL:	81.5	TOP OF SCREEN:	61.5
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	81.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX
3/2/93		ND	ND	ND	ND	ND
9/23/93	36	ND	ND	ND	ND	ND
12/8/93	37.48	ND	ND	ND	ND	ND
3/15/94	36.8	ND	ND	ND	ND	ND
6/24/94	36.8	ND	ND	ND	ND	ND

ALL MEASUREMENTS ARE FROM TOP OF CASING

D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

BURTON FLATS GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 3
TOTAL DEPTH OF WELL: 25.3
WATER WELL DRILLER: EADES

TOP OF SCREEN: 15.3
BASE OF SCREEN: 25.3

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX
3/2/93		ND	ND	ND	ND	ND
9/23/93	20	ND	ND	ND	ND	ND
12/8/93	15.20	ND	ND	ND	ND	ND
3/15/94	15.23	ND	ND	ND	ND	ND
6/24/94	15.22	ND	ND	ND	ND	ND

ALL MEASUREMENTS ARE FROM TOP OF CASING
D - Dilution factor = 20, E - Estimate only; Value is above working linear range, I - Not quantifiable due to matrix interference

3/30/95
OCD/Amoco meeting

PIT DATA

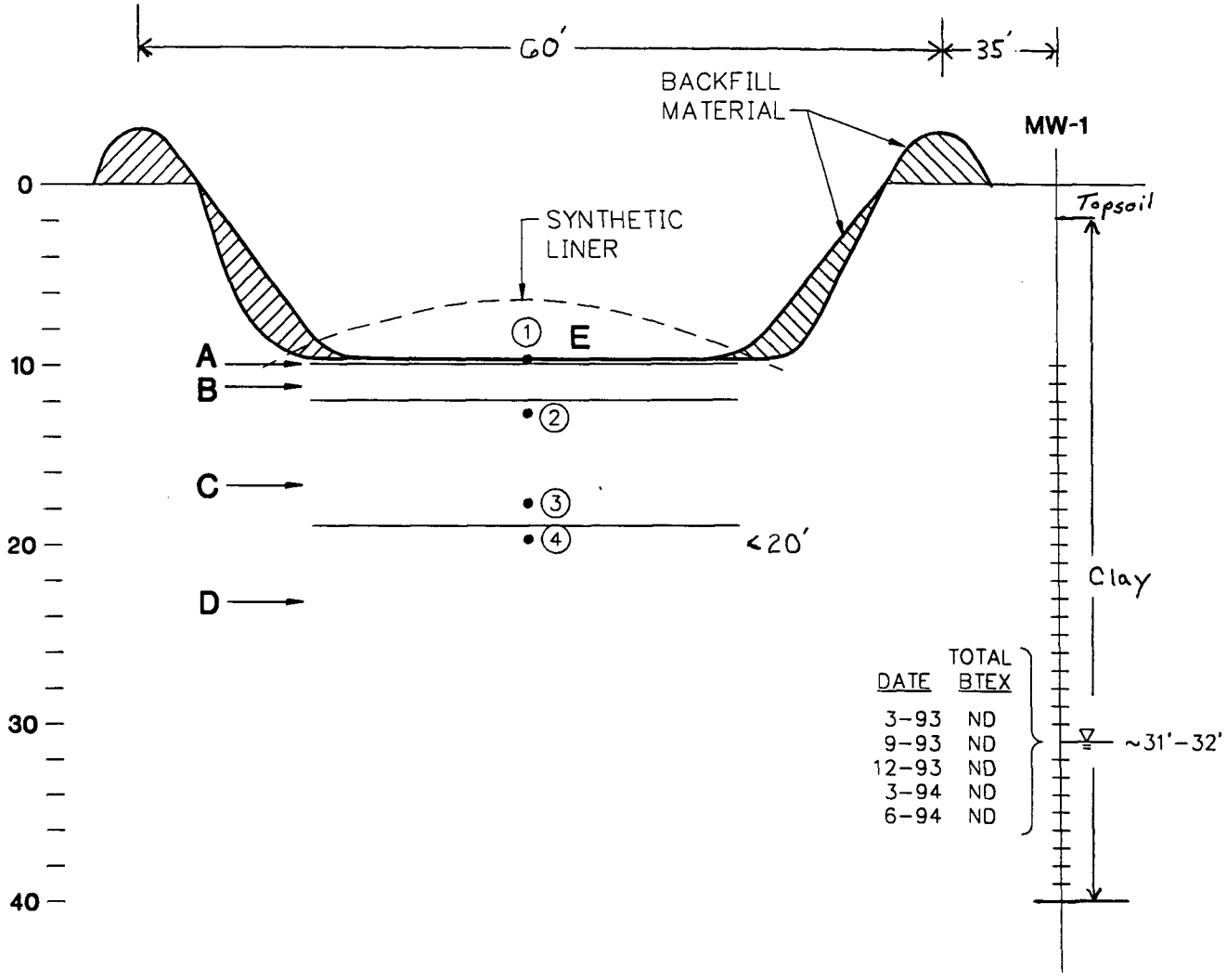
- Type: lined evaporation (new liner 1987)
- Content: Fluids from plant upsets, rain
- Size: 60' x 60' x 10'
- Closure approved (BLM 4-94 & NMOCD 9-94)
  - -if clean bury liner in pit and add fill
  - -if contamination below liner - close based on "Unlined Surface Impound Closure Guidelines" (USICG)
- Contamination depth to ~ 8' below liner (3-9-95)

USICG

A. Site Assessment (Entrix Report)
   1) General Site Characteristics
   2) Soil/Waste Characteristics
   3) Groundwater Quality

B. Remediation Levels
   1) Ranking Criteria
   2) Recommended Remediation Levels

C. Suggested Methods
   1) Excavate
   2) Treat In Place
   3) Alternatives
      - aeration, composting, bioremediation,
      - solidification, thermal treatment



LEGEND:

A – 3" CONTAMINATED SOIL UNDER FORMER LINER
B – 2' CLAY (NO STAINING)
C – 7' STAINED SOIL
D – CLEAN SOIL (CLAY)
E – FILL UNDER LINER

• – SAMPLE LOCATIONS	TPH (mg/kg)	BENZENE (mg/kg)
① – SURFACE	27,567	1.043
② – 3'	4,940	2.341
③ – 8'	8,717	9.232
④ – 10'	<1	0.024

0 10
FEET
APPROXIMATE SCALE

ENTRIX

Figure 1
Amoco Production Company
Burton Flats Gasoline Plant
Evaporation/Overflow Pit

PROJ. NO: 146706	CK:	DATE: 3/95

03/23/95 08:21 TDUNN C:\ACAD\146706\FIG-1

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

TPH/BTEX ANALYSIS REPORT

Company: Amoco Production Co.
Address: P.O. Box 70
City, State: Artesia, NM 88211

Date: 3/10/95
Lab #: H1986(5-10)

Project Name: not given
Location: not given
Sampled by: DC Date: 3/9/95 Time: not given
Analyzed by: HM, MF Date: 3/10/95 Time: 9:35
Sample Type: Soil Sample Condition: Intact Units: mg/kg

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL BENZENE	PARA-XYLENE	META-XYLENE	ORTHO-XYLENE
5	Middle Top	27,567	1.049	1.156	0.325	0.432	1.566	0.604
6	North Pit Top	27,579	3.153	1.003	0.510	0.871	3.016	1.030
7	Middle 3'	4,940	2.341	2.881	1.490	2.909	6.252	2.816
8	Middle 8'	8,737	9.232	0.496	3.403	3.261	0.213	0.032
9	Middle 10'	<1	0.024	<0.001	0.007	<0.001	<0.001	0.011
10	Dehy-Mole Sieve	***	<0.001	0.163	0.021	0.015	0.065	0.015
	QC Recovery	425.5	0.995	0.820	0.927	0.909	0.926	0.946
	QC Spike	405.9	0.881	0.868	0.869	0.866	0.860	0.886
	Accuracy	104.8%	112.9%	94.8%	106.7%	105.0%	107.7%	106.8%
	Air Blank	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Methods - GAS CHROMOTOGRAPHY; INFRARED SPECTROSCOPY
- EPA SW-846; 8020, 418.1, 3540 OR 3510

Michael R. Fowler

3-10-95
Date

ATTACHMENT 2

BURTON FLAT GAS PLANT
GROUNDWATER MONITOR WELLS

SAMPLE LOCATION	SAMPLE DEPTH	DRILL CUTTINGS TPH - PPM	WATER SAMPLE TPH - PPM	WATER SAMPLE BENZENE	WATER SAMPLE TOLUENE	WATER SAMPLE ETHYLBENZENE	WATER SAMPLE XYLENE
Groundwater MW #1	1'	84	TNT	ND	ND	ND	ND
	5'	35					
	20'	30					
	25'	28					
Groundwater MW #2	1'	168	TNT	ND	ND	ND	ND
	5'	44					
	20'	47					
	60'	50					
Groundwater MW #3	1'	83	TNT	ND	ND	ND	ND
	5'	62					
	15'	44					
	20'	43					

TNT = Test Not Taken
ND = Non Detectable At Or Above 0.001 mg/l

JUSTIFICATION FOR IN-PLACE CLOSURE

I Physical Setting
- Eddy County - 10 miles NE Carlsbad
- Nearest surface water body - 8 miles SW
- Nearest water well - 2 miles (?)
- Average annual precipitation ~ 12 inches
- Most rainfall lost to evaporation/transpiration
- Very little, if any, rainfall reaches the ground water

II Subsurface
- 27 ft. of clay exists between the surface and ground water
- 12 - 13 ft. of unaffected clay separates hydrocarbon affected soils and the ground water
- hydrocarbon source has been removed (decreased driving force for further downward migration)
- 2 ft. unaffected clay cap overlies the affected soils
- ground water is "generally impotable and locally unfit for livestock"
- ground water is perched and very low yields
- probably no present foreseeable beneficial use for the ground water
- contamination did not reach the groundwater even though an unlined pit may have existed at the site

CLOSURE PROCEDURE

- Existing 6-7 foot layer of hydrocarbon-affected subsurface soil will remain in place

- The 2 foot unaffected clay layer will remain in place

- The excavated sampling hole will be backfilled with clean soils

- Soils from onsite or offsite will be used to create a mound in the center of the pit

- A 20 ml liner will be placed over the mounded soils covering the entire pit area

- Clean soils from onsite or offsite will be used to backfill the pit and cover the liner

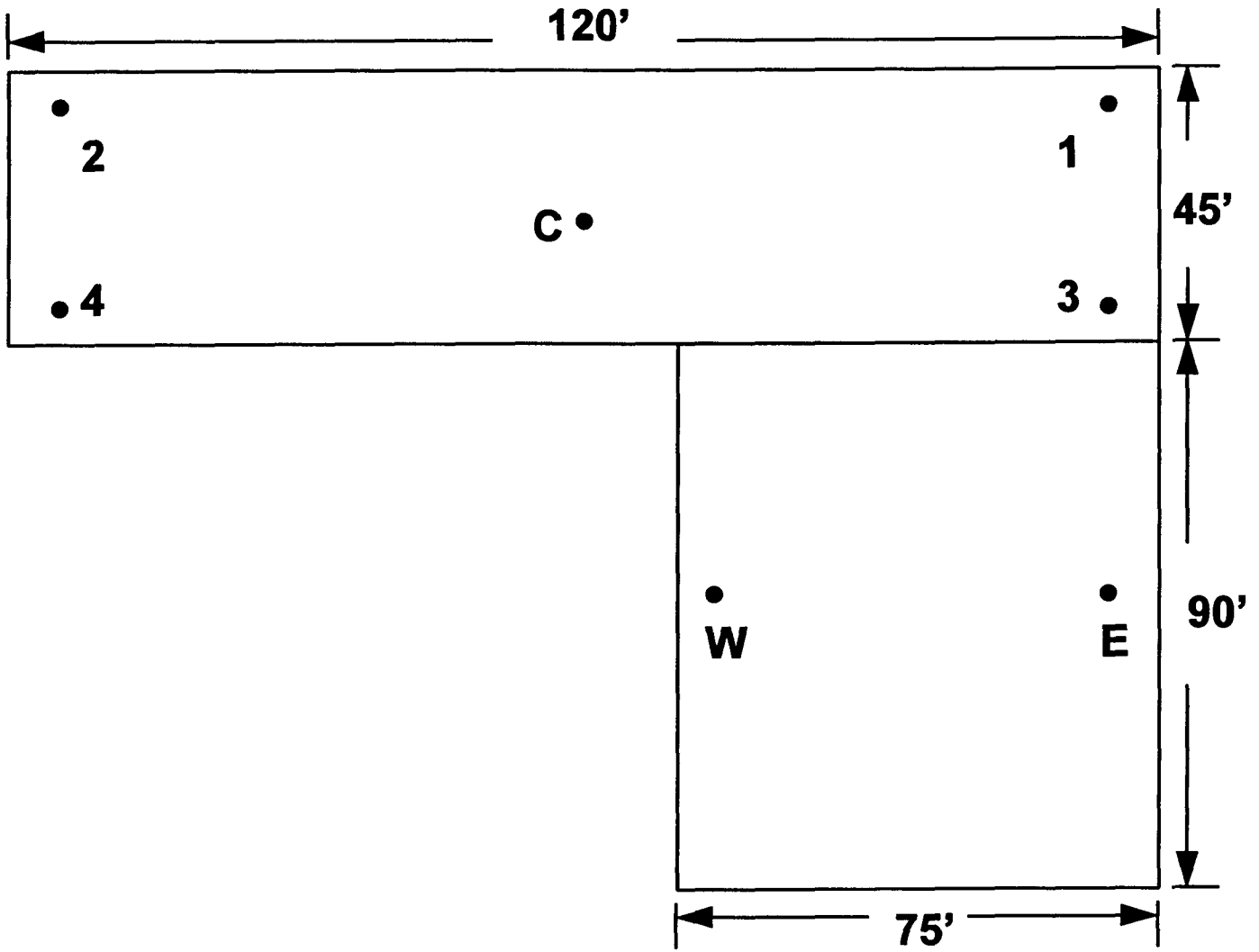
- The liner will be covered with at least 5 feet of soil

- Soils will be contoured on the surface to provide drainage away from the former pit area

- A final closure report will be sent to the NMOCD and the BLM

BURTON FLATS GAS PLANT

On-Site Soil Remediation



BURTON FLATS GAS PLANT

On-Site Soil Remediation Data

I Sample Data

Sample #/Location	Date	TPH(mg/kg)
1-6"	6/17/94	7840
1-6"	3/10/95	4736
2-6"	6/17/94	5475
2-6"	3/10/95	2114
3-6"	6/17/94	6805
3-6"	3/10/95	NS
C-6"	6/17/94	1815
C-6"	3/10/95	8866
4-6"	6/17/94	1892
4-6"	3/10/95	NS
W-6"	3/10/95	3916
E-6"	3/10/95	9435

II Soil Volume

120' x 45' x .5' = 2,700 ft^3.
90' x 75' x .5' = 3,375 ft^3.
6,075 ft^3 / 27 = 225 yd^3

60' x 60' x ?' = 6075 ft^3.
?' = 1.69 ft.

The soils on-site being remediated would cover the bottom of the pit with 1.69'. We would mound this soil to approximately 3' in the center tapering off to 0' along the edge of the pit. Additional fill will be added if necessary and then the mounded soils would be covered with the impermeable liner.

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co. Date: 6/20/94
Address: P.O. Box 67 Lab #: H1707
City, State: Hobbs, NM 88241-0067

Project Name:
Location: Burton Flats Gas Plant
Sampled by: CC Date: 6/17/94 Time: not given
Analyzed by: HM Date: 6/18/94 Time: 11:30
Sample Type: Soil Sample Condition: GIST Units: mg/kg

Samp #	Field Code	TRPHC
1	BFGP Remediation Area NE 7' inside 6" deep	7,840
2	" " " NW 7' inside 6" deep	5,475
3	SE Side - Remediation Area #3 - 6" deep	6,805
4	SW Side - " " BFGP 6" deep	1,892
5	BFGP Remediation Area Mid 6" deep	1,815

QC Recovery	416.9
QC Spike	405.9
Accuracy	102.7%
Air Blank	***

Methods - INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 418.1, 3540 OR 3510

Michael R. Fowler

6-20-94
Date

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

FINAL ANALYSIS REPORT

Company:	Amoco Production	Date:	3/13/95
Address:	P.O.Box 3092	Lab #:	H1985
City, State:	Houston, TX 77253		

Project Name:	BFGP On-Site Remediation				
Location:	BFGP				
Sampled by:	SN	Date:	3/10/95	Time:	12:05
Analyzed by:	HM	Date:	3/13/95	Time:	9:20
Sample Type:	Soil	Sample Condition:	Intact	Units:	mg/kg

Samp #	FIELD CODE	TRPHC
1	BFGP 1-6	4,736
2	BFGP 2-6	2,114
3	BFGP C-6	8,866
4	BFGP W-6	3,916
5	BFGP E-6	9,435
	QC Recovery	422.3
	QC Spike	405.9
	Accuracy	104.0%

Methods - INFRARED SPECTROSCOPY
- EPA SW-846; 418.1, 3540 OR 3510

Michael R. Fowler

3-13-95
Date


8 11 95

Amoco Production Company
South Permian Basin
Business Unit
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

G. D. Henry
Manager, Environment,
Health and Safety

July 24, 1994

William C. Olson
Hydrogeologist
Environmental Bureau
State of New Mexico
Energy, Minerals and Natural Resources Department
P. O. Box 2088
Santa Fe, New Mexico 87504

Dear Bill:

We are in the process of making many upgrades and improvements at the Burton Flats Gas Plant (BFGP). The need for these improvements were defined in our phase II assessment of the plant which we conducted in early 1993 to evaluate the plant purchase. A number of these changes involve the removal of contaminated soils. In order to handle these soils in a cost effective manner Amoco is requesting your approval to bioremediate the soils on-site. The bioremediation process not only reduces costs but it also reduces the transfer of liabilities and potential for unnecessary soil disposals into landfills.

The soils that we would like to bioremediate on-site are associated with the process skid, compressor skid, slop oil tank, vent stack and the evaporation pond (Attachment #1). Some of these soils have already been excavated but at this time they have not been removed from the location. Attachment #2 contains the sample analysis which have been done to date on the soils. The maximum level of contamination observed was 110,878 mg/kg TPH from a surface sample collected south of the compressor skid. The majority of the samples averaged about 10,000 mg/kg TPH.

Our recommended plan is to set up a temporary remediation cell located on the northeast corner of the plant property. We would spread the soil in this area to a maximum lift of 6 inches. Initially we will try to bioremediate the soils without the addition of moisture or nutrients. We will sample the soils quarterly to monitor progress and if the results are not favorable we will request your permission to add either moisture, nutrients or both to enhance degradation.

This bioremediation cell will be closed after we have achieved the appropriate clean-up standards. Based on the ranking criteria from the "Guidelines for Remediation of Leaks, Spills and Releases" this level is 5,000 ppm TPH (Attachment #3). Upon achieving these levels we will sample the cell and submit the results to your office for site closure.

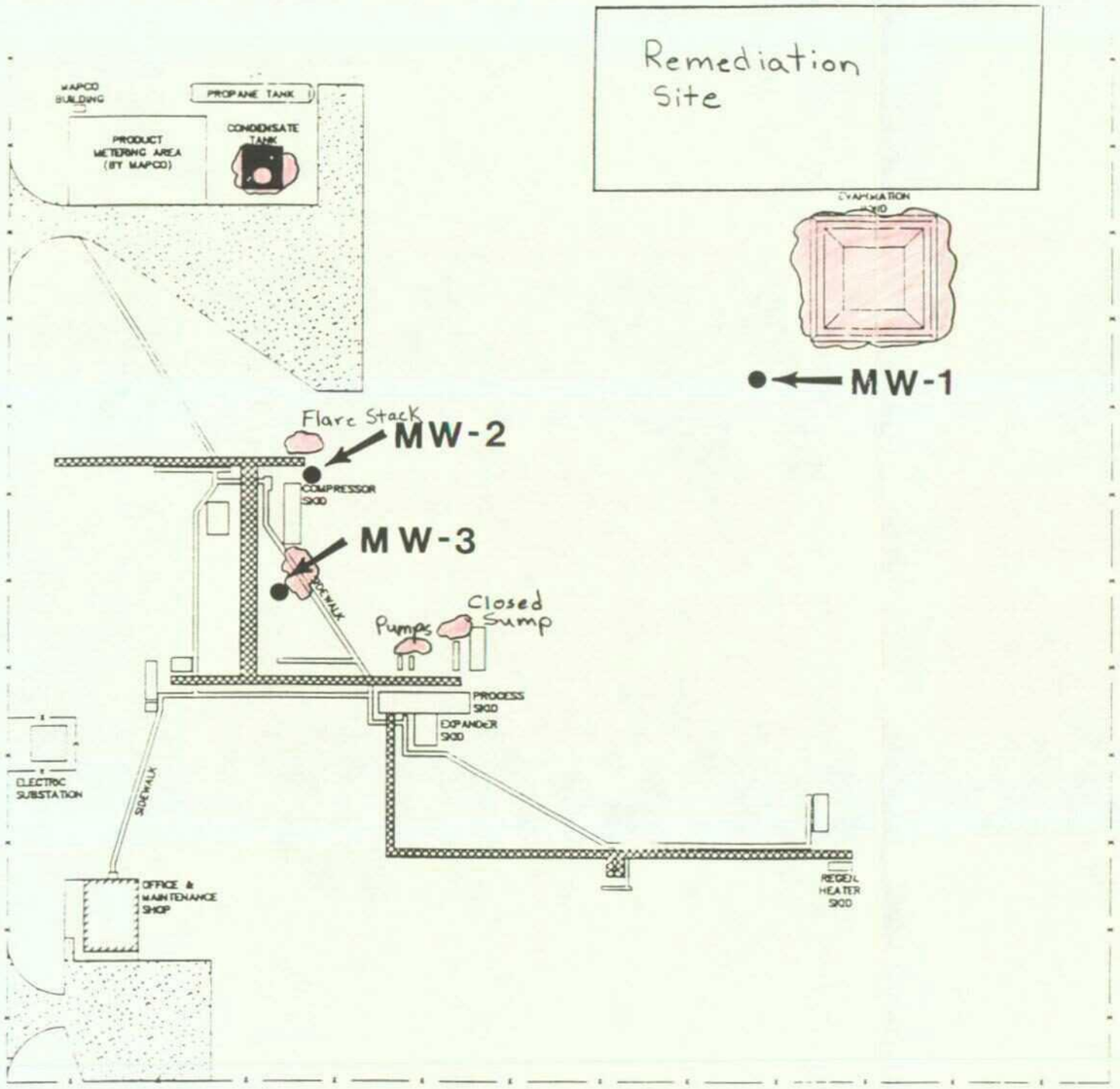
If the above procedure meets your requirements, please notify us of approval so we can proceed. If you have any questions or need any additional information please contact Scott Neumann at 713-366-2501

Sincerely,

G. D. Henry

cc: New Mexico OCD
Atten: Jim Morrow
P O Drawer DD
Artesia, NM 88210

DRAWN BY: LM PITRE 8-12-91 | CHECKED BY: DJS 8/13/91 | APPROVED BY: [illegible] | DRAWING NO. 10-1398-89



Attachment #1

0 feet 80
SCALE

RE: SITE PLAN BY TULSA PRO-QUIP, INC. TITLED "PLOT PLAN BURTON FLATS PLANT" DATED 4-27-77.

Soils to be remediated

G&E ENGINEERING, INC.
ENVIRONMENTAL CONSULTANTS

DATE	NO	REVISION	BY

Amoco Production Company
Burton Flats Gas Plant
Carlsbad, New Mexico

SITE PLAN

Fig. No.

BURTON FLATS GAS PLANT
SOIL SAMPLING DATA

SAMPLE LOCATION	SAMPLE DEPTH	LAB TPH (PPM)	OVM READING
Vent Stack	6"	743	2
	18"	N/A	0
	30"	31411	0
Compressor Station	6"	N/A	0
	18"	N/A	0
	30"	183	0
Slop Oil Tank	6"	N/A	22
	18"	21335	18
	30"	24165	118
	48"	15183	33/146
Dehydration Area	6"	N/A	0
	18"	43.7	0
Process Area	6"	29163	29
	18"	N/A	58
	30"	11774	77
Chemical Storage A	6"	731.5	8
	18"	547	4

Attachment #2

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co.
Address: P.O. Box 3092
City, State: Houston, TX 77250-3092

Date: 2/22/93
Lab#: H1155

Project Name: Empire Abo
Project Location: Artesia, NM
Sampled by: SN Date: 2/18/93 Time:
Analyzed by: MF Date: 2/20/93 Time: 12:00
Type of Samples: Soil Sample Condition: GIST Units: mg/kg, mg/l

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL BENZENE	PARA-XYLENE	META-XYLENE	ORTHO-XYLENE	MTBE
1	Comp. NE 30"	183.3	***	***	***	***	***	***	***
2	BFGP #1-1'	84.0	***	***	***	***	***	***	***
3	BFGP #1-5'	35.2	***	***	***	***	***	***	***
4	BFGP #1-20'	30.0	***	***	***	***	***	***	***
5	BFGP #1-35'	28.0	***	***	***	***	***	***	***
6	BFGP #2-1'	167.5	***	***	***	***	***	***	***
7	BFGP #2-5'	43.6	***	***	***	***	***	***	***
8	BFGP #2-20'	47.2	***	***	***	***	***	***	***
9	BFGP #2-60'	49.7	***	***	***	***	***	***	***
10	Slop O.Tnk.-18"	21,335	***	***	***	***	***	***	***
11	Slop O.Tnk.-30"	24,165	***	***	***	***	***	***	***
12	Vent Stack-30"	31,411	***	***	***	***	***	***	***
13	Vent Stack-6"	742.8	***	***	***	***	***	***	***
	QC Recovery	350.2	***	***	***	***	***	***	***
	QC Spike	336.2	***	***	***	***	***	***	***
	Accuracy	104.2%	***	***	***	***	***	***	***
	Air Blank	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Methods - AUTOMATED HEADSPACE GC; INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 8020, 418.1, 3540 OR 3510

Michael R. Fowler

Date 2/22/93

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co.
Address: P.O. Box 3092
City, State: Houston, TX 77250-3092

Date: 2/22/93
Lab#: H1157

Project Name: Burton Flat Gas Plant
Project Location:
Sampled by: T.W. Scott Date: 2/19/93 Time:
Analyzed by: MF Date: 2/20/93 Time: 1:00
Type of Samples: Soil Sample Condition: GIST Units: mg/kg, mg/l

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL BENZENE	PARA-XYLENE	META-XYLENE	ORTHO-XYLENE	MTBE
1	BFGP #3-1'	83.4	***	***	***	***	***	***	***
2	BFGP #3-5'	62.0	***	***	***	***	***	***	***
3	BFGP #3-15'	44.2	***	***	***	***	***	***	***
4	BFGP #3-20'	42.9	***	***	***	***	***	***	***
5	BFGP S.Tnk.-48"	15,183	***	***	***	***	***	***	***
6	BFGP D.A.-18"	43.7	***	***	***	***	***	***	***
7	BFGP C.S.A.-6"	731.5	***	***	***	***	***	***	***
8	BFGP C.S.A.-18"	547.0	***	***	***	***	***	***	***
9	BFGP P.A.-6"	29,163	***	***	***	***	***	***	***
10	BFGP P.A.-30"	11,774	***	***	***	***	***	***	***
	QC Recovery	350.2	***	***	***	***	***	***	***
	QC Spike	336.1	***	***	***	***	***	***	***
	Accuracy	104.2%	***	***	***	***	***	***	***
	Air Blank	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Methods - AUTOMATED HEADSPACE GC; INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 8020, 418.1, 3540 OR 3510

Michael R. Fowler

Date 2/22/93

BURTON FLAT GAS PLANT
GROUNDWATER MONITOR WELLS

SAMPLE LOCATION	SAMPLE DEPTH	DRILL CUTTINGS TPH - PPM	WATER SAMPLE TPH - PPM	WATER SAMPLE BENZENE	WATER SAMPLE TOLUENE	WATER SAMPLE ETHYLBENZENE	WATER SAMPLE XYLENE
Groundwater W #1	1'	84	TNT	ND	ND	ND	ND
	5'	35					
	20'	30					
	35'	28					
Groundwater W #2	1'	168	TNT	ND	ND	ND	ND
	5'	44					
	20'	47					
	60'	50					
Groundwater W #3	1'	83	TNT	ND	ND	ND	ND
	5'	62					
	15'	44					
	20'	43					

TNT = Test Not Taken
ND = Non Detectable At Or Above 0.001 mg/l

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co.
Address: P.O. Box 67
City, State: Hobbs, NM 88241-0067

Date: 12/22/93
Lab#: H1465

Project Name: Burton Flats Gas Plant
Project Location:
Sampled by: CC Date: 12/21/93 Time:
Analyzed by: HM Date: 12/22/93 Time: 10:30
Type of Samples: Soil Sample Condition: GIST Units: mg/kg

	Samp #	Field Code	TRPHC	
1	1	Wall Midway 6' Skid Sl.	7,153	North Sump
	2	Floor 14'	4,417	
	3	Floor 10'	1,219	
	4	Ground Level	18,212	
2	5	Engine Drain-Ground Lv.	74,658	South of Compressor
	6	S.End Drain-Floor 10'	4,036	
	7	Wall at Floor 14' "	26.6	
	8	Fan Side of Compressor 6"	110,878	
	9	Floor 6'	29,995	
	10	Midway 9'	6,729	
3	11	Slop Oil Tnk-S. Side 5'	6,459	Slop Oil Tank
	12	Slop Oil Tnk-W. Side 5'	7,227	
	13	Slop Oil Tnk-Top Soil 6"	53,030	

QC Recovery	421.3
QC Spike	405.9
Accuracy	103.8%
Air Blank	***

Methods - INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 418.1, 3540 OR 3510

Michael R. Fowler

Date 12-22-93

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co.
Address: P.O. Box 67
City, State: Hobbs, NM 88241-0067

Date: 6/20/94
Lab #: H1708

Project Name:
Location: Burton Flats Gas Plant
Sampled by: CC Date: 6/17/94 Time: not given
Analyzed by: HM Date: 6/18/94 Time: 11:55
Sample Type: Soil Sample Condition: GIST Units: mg/kg

Samp #	Field Code	TRPHC
1	BFGP 6" Deep East 3' Process Skid	4,280
2	BFGP 12" Deep East 3' Process Skid	60.2
3	BFGP 24" Deep East 3' Process Skid	<1.0
	QC Recovery	416.9
	QC Spike	405.9
	Accuracy	102.7%
	Air Blank	***

Methods - INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 418.1, 3540 OR 3510

Michael R. Fowler

6-20-94
Date

2. Unsaturated Contaminated Soils

The general site characteristics obtained during the sit assessment (Section III.A.) will be used to determine the appropriate soil remediation action levels using a risk based approach. Soils which are contaminated by petroleum constituents will be scored according to the ranking criteria below to determine their relative threat to public health, fresh waters and the environment.

a. Ranking Criteria

Depth To Ground Water	Ranking Score
<50 feet	20
50 - 99	10
>100	(0)*

* The water present would probably not be conside. groundwater and has no present or foreseeable beneficial use.

Wellhead Protection Area	
<1000 feet from a water source, or; <200 feet from private domestic water source	
Yes	20
No	(0)

Distance To Surface Water Body	
<200 horizontal feet	20
200 - 1000 horizontal feet	10
>1000 horizontal feet	(0)

Total 0

Attachment #3

b. Recommended Remediation Action Level

The total ranking score determines the degree of remediation that may be required at any given site. The total ranking score is the sum of all four individual ranking criteria listed in Section IV.A.2.a. The table below lists the remediation action level that may be required for the appropriate total ranking score.

(NOTE: The OCD retains the right to require remediation to more stringent levels than those proposed below if warranted by site specific conditions (ie. native soil type, location relative to population centers and future use of the site or other appropriate site specific conditions.)

	Total Ranking Score		
	>19	10 - 19	0 - 9
Benzene(ppm)*	10	10	10
BTEX(ppm)*	50	50	50
TPH(ppm)**	100	1000	5000

* A field soil vapor headspace measurement (Section V.B.1) of 100 ppm may be substituted for a laboratory analysis of the Benzene and BTEX concentration limits.

** The contaminant concentration for TPH is the concentration above background levels.

B. GROUND WATER

Contaminated ground water is defined as ground water of a present or foreseeable beneficial use which contains free phase products, dissolved phase volatile organic constituents or other dissolved constituents in excess of the natural background water quality. Ground water contaminated in excess of the WQCC ground water standards or natural background water quality will require remediation.

V. SOIL AND WATER SAMPLING PROCEDURES

Below are the sampling procedures for soil and ground water contaminant investigations of leaks, spills or releases of RCRA Subtitle C exempt oil field petroleum hydrocarbon wastes. Leaks, spills or releases of non-exempt RCRA wastes must be tested to demonstrate that the wastes are not characteristically hazardous according to RCRA regulations. Sampling for additional

Amoco Production Company
South Permian Basin
Business Unit
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

G. D. Henry
Manager, Environment,
Health and Safety

June 23, 1994

William C. Olson
Hydrogeologist
Environmental Bureau
State of New Mexico
Energy, Minerals and Natural Resources Department
P. O. Box 2088
Santa Fe, New Mexico 87504

Dear Bill:

We are supplying you with the following report which should answer your questions related to the soil and groundwater issues at our Burton Flats Gas Plant. The samples were collected to evaluate the plant for purchase and many of the areas of concern and plant operations have been remediated or upgraded. We have currently remediated on-site most of the soils which had exceeded the OCD's recommended contaminant levels.

If you have any additional questions or concerns please contact Scott Neumann at 713-366-2501.

Sincerely,

G. D. Henry

SNN/jsl
Attachment

BURTON FLATS GAS PLANT
SOIL AND GROUNDWATER EVALUATIONS

The data that was sent to you in April was our Phase II assessment of the Burton Flats Gas Plant (BFGP) located in Eddy County, New Mexico. This data was acquired to evaluate potential environmental liabilities associated with the purchase of the plant. Since this data was acquired a considerable amount of work has been done to remediate the areas of concern.

As you stated in your letter dated May 20, 1994, high levels of petroleum contaminants were found at the vent stack, slop oil tank and in the process area. A copy of the analysis sent to you has been included as Attachment #1. Actions have been taken to eliminate the problems.

Four locations around the vent stack were sampled and analyzed for TPH (Attachment #2). Each location was sampled from depths of 6", 18" and 30" and a composite sample was analyzed on-site and also sent to Cardinal Laboratories in Hobbs, New Mexico for confirmation of the on-site data. Based on visual appearance and cross-checking of the on-site analysis with the lab analysis, it became apparent that the 6" and 30" samples collected at the vent stack and sent to Cardinal Laboratories were switched. Attachment #3 shows that the 30" sample analyzed on-site had a TPH level of 770 mg/kg which compares with the 743 mg/kg from the lab for the 6" sample. A similar comparison can also be seen from the other two samples. This was further confirmed upon excavation where the soil was only discolored in the top 6"-8" and the top approximately 18" of soil was removed. After the soil was removed the hole was filled with clean soil and a 15' x 15' concrete pad was poured around the vent stack. The removed soil is being bio-remediated on-site.

The slop oil tank has been removed and replaced with a concrete and steel double lined sump and tank enclosed in concrete. The soil from under the tank was sampled at depths of 6", 18", 30" and 48". At a depth of 48" the composite sample from sites 1 and 2 (Attachment #4) had a TPH level of 15,183 mg/kg. In December the slop oil tank was removed. At a depth of

approximately 6", from under the removed tank, the TPH level was 55,030 mg/kg (Attachment #5 - sample #13). At a depth of 5' the levels dropped to 6400-7200 mg/kg (samples #11 and #12). Below this level no visual evidence of contamination or odor was encountered. The hole was dug out to a depth of approximately 6 feet. Three truckloads (approximately 70 yd^3) of clean soil was brought in to fill the hole. The slop oil tank has been relocated to the south end of the plant and the entire drain system has been replaced. The new system will be periodically pressure tested in accordance with our Discharge Plan.

The final area of concern was in the vicinity of the process area. Composite samples were collected at sites #1 and #2 (Attachment #6) at depths of 6", 18" and 30". Nearly all of the visual contamination appeared to come from site #2 north of the pumps. At 30" a composite sample measured 11,774 mg/kg TPH. Soils in the area north of the pumps were removed until they were free of visual contamination and odor. No samples were collected at the bottom of this hole. The hole was filled with clean soil and a concrete pad was placed under the booster pumps. The area to the east of the process skid has not been addressed since it is not possible to dig in this area without removing the skid. Samples were collected at depths of 6", 12", and 24" on June 17, 1994 and the analysis is summarized on Attachment #7. The samples suggest that only surface contamination exists in this area and it appears that it is not leaching down and should not threaten groundwater. None of the samples tested exceeded 5000 mg/kg TPH and at 24" the sample had < 1 mg/kg TPH.

Two additional areas of concern were identified while removing the old drain/sump system. These areas were located just south of the compressor skid and just northeast of process skid. Samples 5-10 (Attachment #5) were collected south of the compressor skid. The depths of the samples are shown on the Cardinal Laboratories analysis. The analysis along with observations of visual contamination and odor suggest all contamination at this site was removed.

The area to the northeast of the process skid was the location of a buried sump which we removed. Samples 1-4 (Attachment #5) were taken from this site. Soils to 14 feet were

removed accounting for the majority of the contamination. This is also the current site of a double-walled sump for the new drain system.

A copy of Amoco's South Permian Basin Business Unit's Soil Remediation Guidelines for Crude Oil Spills has been included as Attachment #8. Although these criteria are for spills they are also used as guidelines for the remediation of newly discovered areas of concern.

Item #2 requests a map showing the locations of the monitor wells and the direction of the hydraulic gradient. The monitor well locations have been provided on Attachment #9. The wells were installed in February of 1993 in order to evaluate if groundwater was present at this site and, if so, was it clean. None of the wells appear to be completed in the same water biering zone and therefore no hydraulic gradient is known. Based on a 1952 New Mexico Bureau of Mines and Minerals Resources report, the area groundwater movement is to the south-southwest.

No contamination was observed in the soils while drilling the three monitor wells. Attachment #10 summarizes the soil samples collected while drilling. The summary also includes the initial water analysis taken after drilling which shows all three wells to be non-detect for BTEX.

The monitor wells are not capable of providing a usable supply of water. While drilling it was very difficult to determine if water was present and only after the wells sat for approximately 24 hours was a measurable amount of water found. Our sampling procedure for monitor wells requires withdrawing three well volumes prior to sampling. None of the wells at the BFGP are capable of providing this much water so the wells are pumped dry and then a sample is collected. For this reason we have referred to the water zones as small aquitards. The literature also suggests that no major or minor aquifers exist in this area.

Item #3 requests the well construction schematics and water table elevation information. Attachment #11 provides you with the well schematics. Although the wells have not been

surveyed in the surface area is flat and the casing in each case is approximately three feet above the surface. Attachment #12 summarizes the water levels and the BTEX data for each of the sampling events. In each case the analysis shows non-detect BTEX levels in the water.

Based on the depths to water variations seen over time we feel that monitor wells 1 and 3 are completed in a shallow aquitard(s) and monitor well 3 is probably completed in a deeper confined aquitard. In any case we have not seen any contamination in the soils or waters associated with the wells.

It is important to keep in mind that although groundwater was encountered as shallow as 15 feet below the surface we have never seen any contamination. Based on the definition of groundwater as stated in NMOCD's "Guidelines for Remediation of Leaks, Spills and Releases", it is possible that no remediation of groundwater would be required even if contamination were found since there is probably not sufficient quantities of water present to provide for present or foreseeable beneficial use. Many upgrades to the plant and operational practices have taken place and should greatly reduce the potential for future contamination. We will continue to sample the monitor wells at least once a year and if we see any contamination we will notify your office.

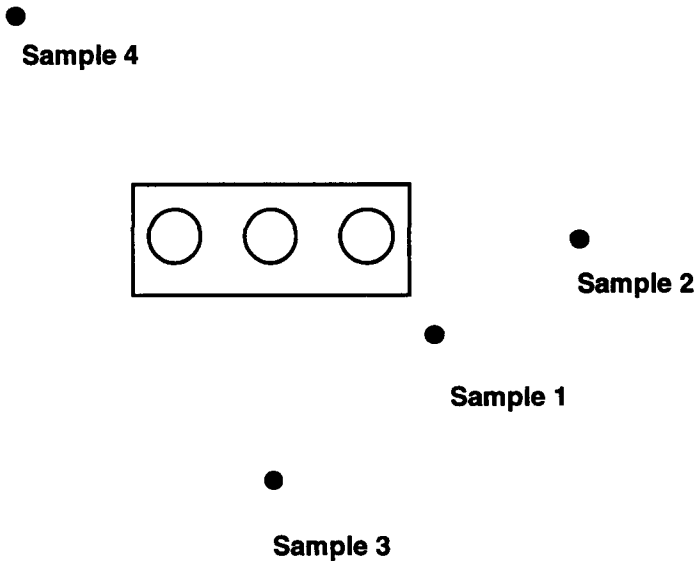
If you have any questions or need additional information please contact Scott Neumann at 713-366-2501.

BURTON FLATS GAS PLANT
SOIL SAMPLING DATA

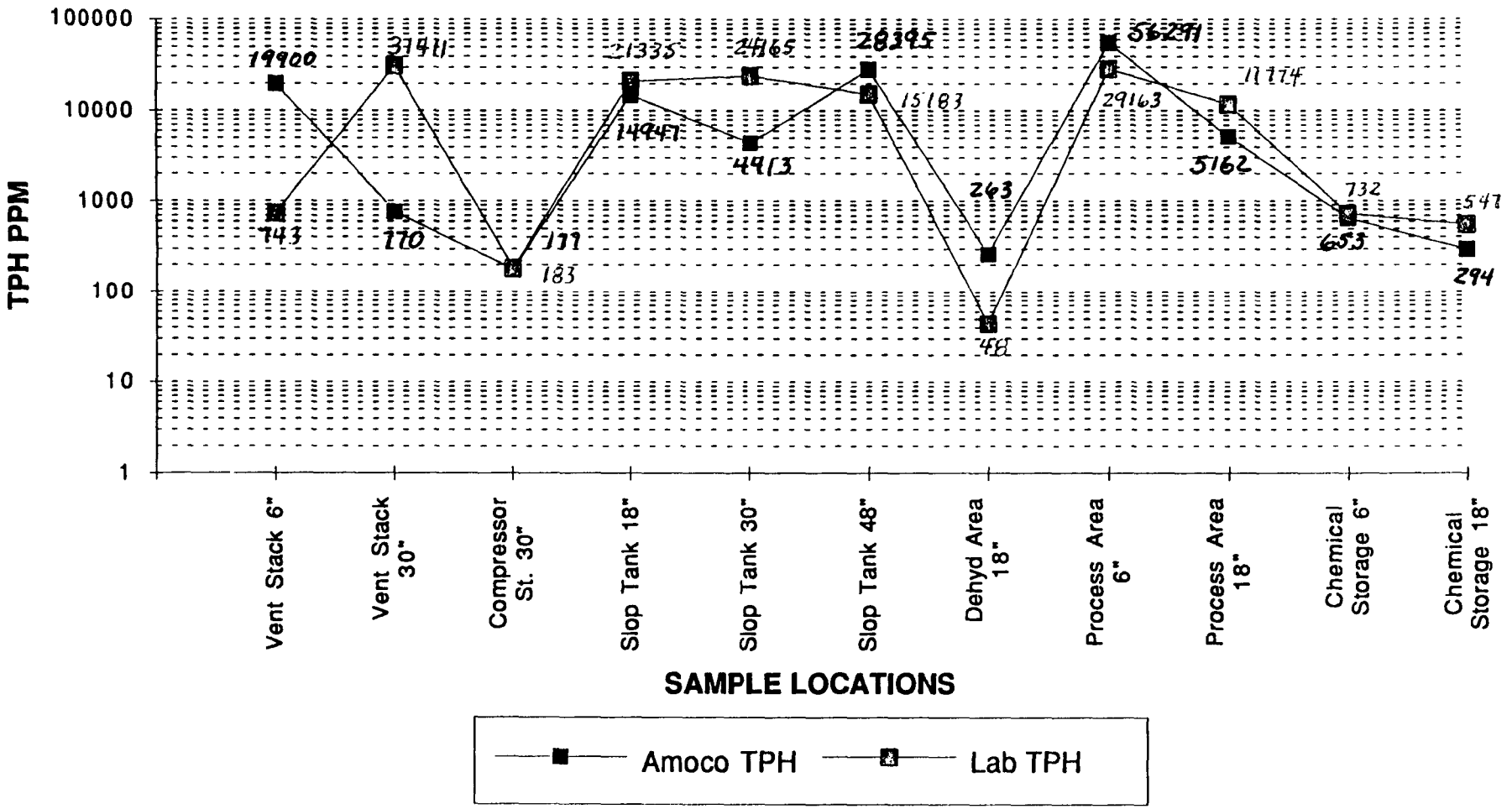
SAMPLE LOCATION	SAMPLE DEPTH	LAB TPH (PPM)	OVM READING
Vent Stack	6"	743	2
	18"	N/A	0
	30"	31411	0
Compressor Station	6"	N/A	0
	18"	N/A	0
	30"	183	0
Slop Oil Tank	6"	N/A	22
	18"	21335	18
	30"	24165	118
	48"	15183	33/146
Dehydration Area	6"	N/A	0
	18"	43.7	0
Process Area	6"	29163	29
	18"	N/A	58
	30"	11774	77
Chemical Storage A	6"	731.5	8
	18"	547	4

ATTACHMENT 1

VENT STACK

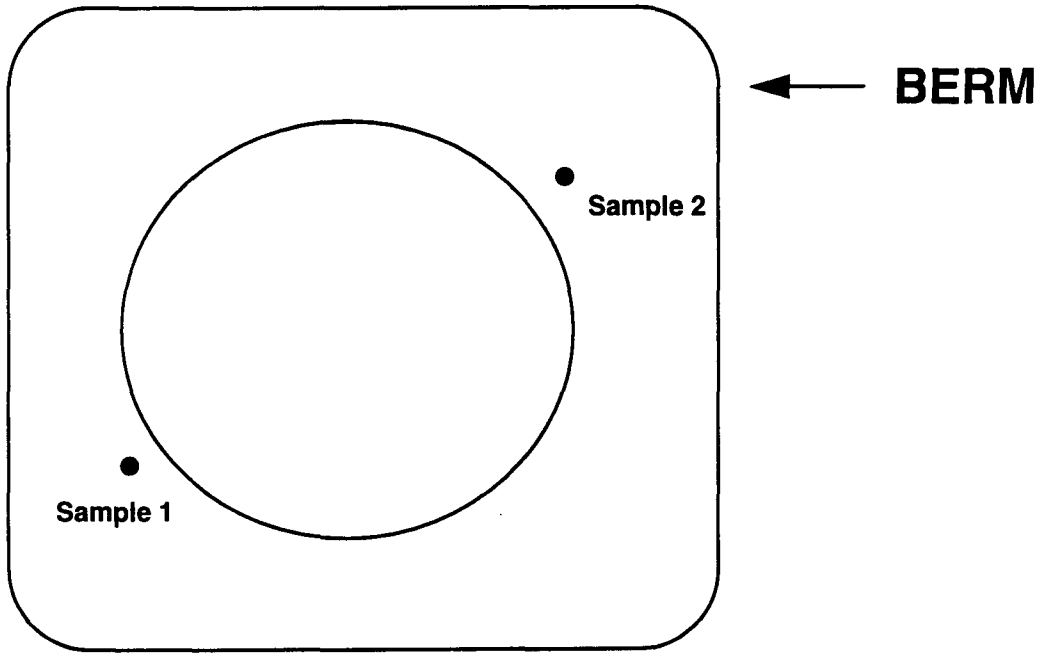


BFGP TPH COMPARISON



ATTACHMENT 3

SLOP OIL TANK



ATTACHMENT 4

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co. Date: 12/22/93
Address: P.O. Box 67 Lab#: H1465
City, State: Hobbs, NM 88241-0067

Project Name: Burton Flats Gas Plant
Project Location:
Sampled by: CC Date: 12/21/93 Time:
Analyzed by: HM Date: 12/22/93 Time: 10:30
Type of Samples: Soil Sample Condition: GIST Units: mg/kg

****

Samp #	Field Code	TRPHC
1	Wall Midway 6' Skid Sl.	7,153
2	Floor 14'	4,417
3	Floor 10'	1,219
4	Ground Level	18,212
5	Engine Drain-Ground Lv.	74,658
6	S.End Drain-Floor 10'	4,036
7	Wall at Floor 14'	26.6
8	Fan Side of Compressor 6"	110,878
9	Floor 6'	29,995
10	Midway 9'	6,729
11	Slop Oil Tnk-S. Side 5'	6,459
12	Slop Oil Tnk-W. Side 5'	7,227
13	Slop Oil Tnk-Top Soil 6"	53,030

QC Recovery	421.3
QC Spike	405.9
Accuracy	103.8%
Air Blank	***

Methods - INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 418.1, 3540 OR 3510

Michael R. Fowler

Date 12-22-93

ATTACHMENT 5

Pg 1

H1465

Chain of Custody Record

ARDINAL LABORATORIES
PHONE: (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

Project I.D. Burton Flats Gas Plant
Project Location Eddy Co.
Sampled By
Client Name Amoco Production Co.
Address 1017 - West Stanolind Rd.
Telephone 397-8206 - K. C. Cook

fax 397-8204

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: TPH							Remarks (Type sample, preservation, etc.)
1	12/21			✓	BFGP - North Sump Process Skid	1	✓							Wall Midway Skid side
2	12/21			✓	✓ ✓ ✓	1	✓							Floor 14'
3	12/21			✓	✓ ✓ ✓	1	✓							Floor 10'
4	12/21			✓	✓ ✓ ✓ Process Area	1	✓							Ground Level
5	✓			✓	✓ ✓ Engine drain Tank	1	✓							Ground Level
6	✓			✓	✓ ✓ South end ✓ ✓	1	✓							Floor 10'
7	✓			✓	✓ ✓ Sump Area	1	✓							Wall at Floor
8	✓			✓	✓ ✓ Fuel Side - Rem Hole	1	✓							Fan side of Compressor
9	✓			✓	✓ ✓ ✓ ✓ ✓ ✓	1	✓							Floor
10	✓			✓	✓ ✓ Slop oil Tank Area	1	✓							Midway 9'
11	✓			✓	✓ ✓ ✓ ✓ ✓ ✓	1	✓							South Side
12	✓			✓	✓ ✓ ✓ ✓ ✓ ✓	1	✓							West Side

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
K. Casey Cook	12/21	1	Hope S. Moreno
Relinquished by: (Signature)	Date	Time	Received by: (Signature)

Remarks:

Shipped/Delivered

H1465 Pg 2

Chain of Custody Record

ARDINAL LABORATORIES
PHONE: (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

Project I.D. Burton Flats Gas Plant
Project Location Eddy Co.
Sampled By
Client Name Amoco Production Co.
Address 1017 - West Stanolind Rd
Telephone 397-8206 - L. Carey Cook

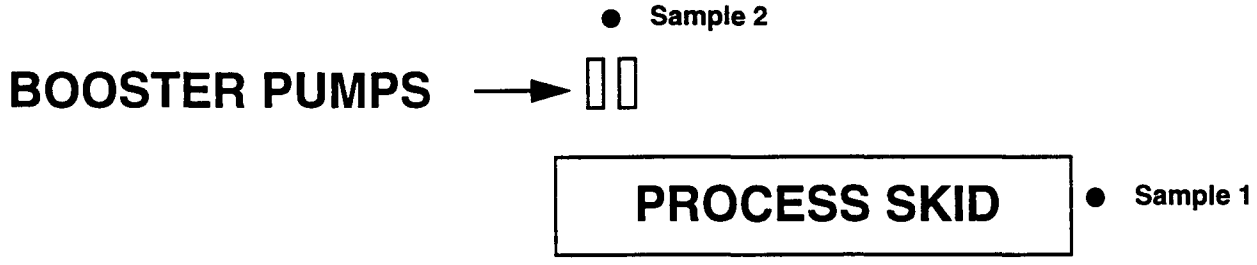
Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	Analysis Required: TPH							Remarks (Type sample, preservation, etc.)
13	12/21			✓	BFGP - Slop Oil Tank.	1	1							Top Soil

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
L. Carey Cook	12/21		
Relinquished by: (Signature)	Date	Time	Received by: (Signature)

Remarks:

Shipped/Delivered

PROCESS AREA



CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co.
Address: P.O. Box 67
City, State: Hobbs, NM 88241-0067

Date: 6/20/94
Lab #: H1706

Project Name:
Location: Burton Flats Gas Plant
Sampled by: CC Date: 6/17/94 Time: not given
Analyzed by: HM Date: 6/18/94 Time: 11:55
Sample Type: Soil Sample Condition: DIST Units: mg/kg

Samp #	Field Code	TRPHC	
1	BFBP 6" Deep East 3' Process Skid	4,280	4820
2	BFBP 12" Deep East 3' Process Skid	60.2	60.2
3	BFBP 24" Deep East 3' Process Skid	<1.0	<1.0

QC Recovery	416.9
QC Spike	485.9
Accuracy	102.7%
Air Blank	***

Methods - INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 418.1, 3540 OR 3518

Michael R. Fowler

6-20-94
Date

ATTACHMENT 7

SOUTH PERMIAN BASIN BUSINESS UNIT
SOIL REMEDIATION GUIDELINES FOR CRUDE OIL SPILLS

Following are the SPBBU soil remediation guidelines which are to be utilized in remediation operations for new hydrocarbon spills at active well sites, batteries and flowlines.

Minimum concentration levels for TPH shall be based on state regulatory requirements or SPBBU target levels, whichever is more stringent. SPBBU target levels for New Mexico and Texas consists of 0.1% (1000 ppm) for surface and subsurface TPH within the spill area. For those spills where an above ground remediation plot will be used, SPBBU target levels for TPH will be 0.5% (5000 ppm) or less. A summary and a copy of hydrocarbon spill regulations for Texas and New Mexico are found in Appendixes A and B, respectively. These appendixes should be consulted for specific state requirements for contaminate levels, risk based assessments, and reporting requirements.

The SPBBU has portable TPH analyzer machines for onsite TPH analysis or soil samples may be sent for offsite analysis to a SPBBU approved laboratory (Contact your Field EH&S Coordinator).

GUIDELINES

1) Notification

- **ALL CRUDE OIL SPILLS/LEAKS** (as well as any other spill) **MUST** be immediately reported to the Amoco Hotline.

2) Initial Response

- Source elimination and site security as appropriate.
- Containment of spill material.
- Site stabilization and immediate removal of free liquid.

3) Excavation

- All hydrocarbon contaminated soil associated with the spill/leak containing more than 0.1% (1000 ppm) of TPH **MUST** be brought to the surface for remediation.

- For crude oil spills/leaks which occur onto an area with prior existing hydrocarbon soil contamination, the **FRESH SPILL MUST** be excavated as outlined above. The prior hydrocarbon soil contamination shall be handled on a case by case basis. The EH&S Coordinator **MUST** be notified for guidance before any remediation activity begins on the prior existing contamination.

4) Remediation Of Soil

- **Remediation** of the hydrocarbon contaminated soil **MUST** begin as soon as possible.

- **Insitu remediation** (in place) may be used for crude oil spills of one (1) barrel or less with a soil contamination depth of twelve (12) inches or less. The soil to be remediated must be mixed with clean ambient (surrounding) soil or other new soil to achieve a uniform mixture consisting of 0.1% (1000 ppm) or less of TPH. Should there be excess soil from this mixture that can not be leveled out within the spill area, it shall be placed in an onsite remediation plot no more than twelve (12) inches in depth for further biodegradation. In certain situations, exceptions to the insitu remediation guidelines may be warranted. **These exceptions MUST be approved by the EH&S Manager.** Contact your Field EH&S Coordinator for assistance.

- **Onsite landfarming** shall be used for **ALL** crude oil spills greater than one (1) barrel. The excavated soil must be mixed with clean ambient (surrounding) soil or other new soil to achieve a uniform mixture consisting of 0.5% (5000 ppm) or less of TPH. This mixture shall be placed in an onsite remediation plot no more than twelve (12) inches in depth for further biodegradation.

- The **EH&S Coordinator** shall be responsible for coordinating the:

  - **Sampling** of the remediated soil (*see Waste Management Guidelines, Section VI, SPBBU Soil Sampling Guidelines),*
  - **Documentation** of sample coordinates and remediation plot location,
  - **Analysis** of the remediated soil (portable TPH meter or outside lab) and
  - **Submitting** to the Houston EH&S Group the appropriate information as required by that state's spill reporting requirements *(see Appendix A for New Mexico and Appendix B for Texas)*

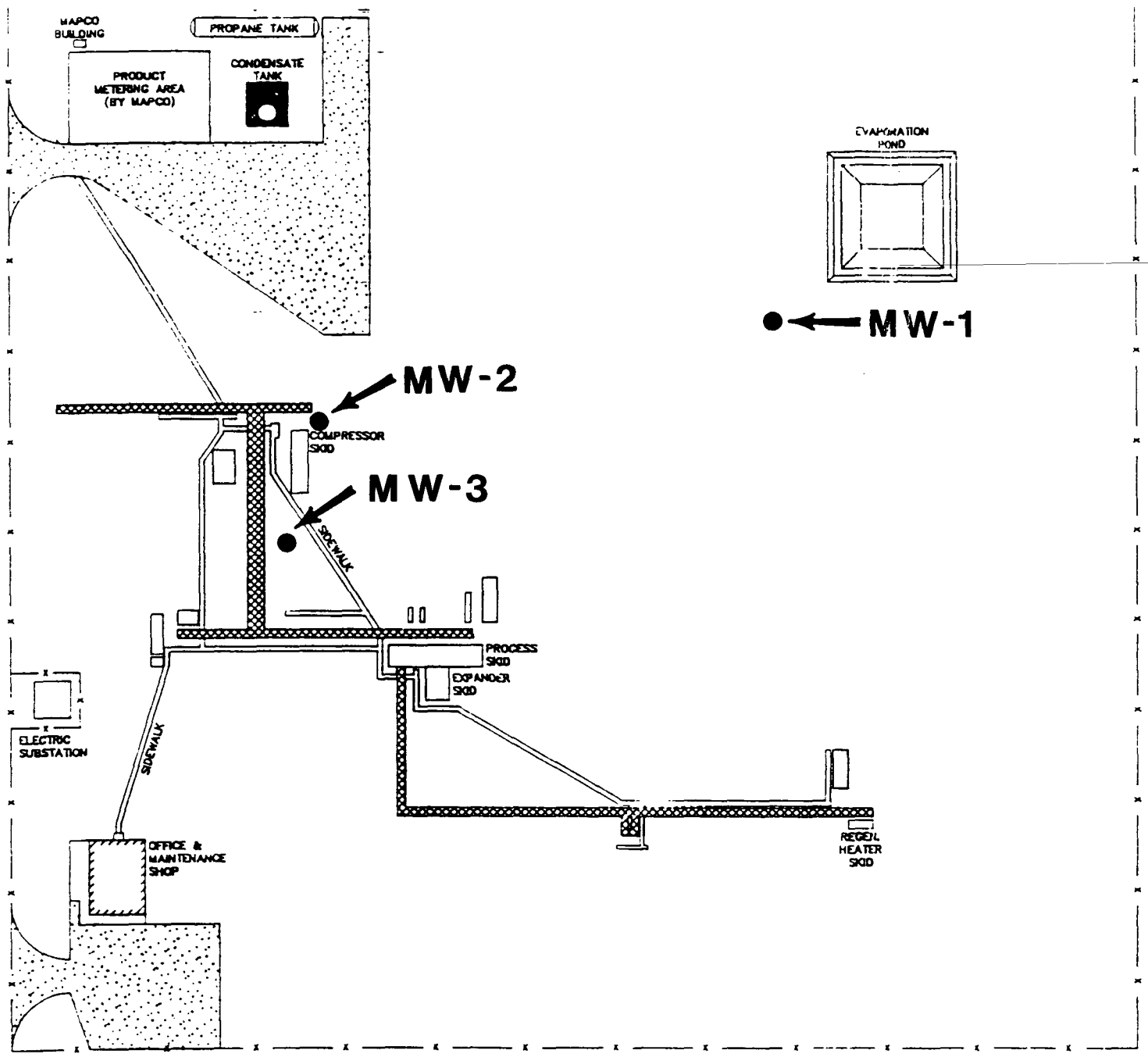
5) Remediation Costs

- Each separate, new crude oil spill at a facility, well site or flowline will be considered a single project. If projected remediation costs exceed the operators agreement allowance, an AFE must be sent to all working interest owners.

  - **If an AFE is submitted, work should not commence *(excludes initial response,* see *Step #2)* until receipt of approval by:**

    - Working interest owners,
      - Exceptions to the WI owners approval may be warranted in emergency situations. Contact your Field EH&S Coordinator.
    - Appropriate regulatory agency(ies) and
    - SPBBU EH&S Group.

DRAWN BY: LM PITRE 8-12-91
CHECKED BY: DLE 8/13/91
APPROVED BY:
DRAWING NO. 10-1398-89



N

0 feet 80
SCALE

RE: SITE PLAN BY TULSA PRO-QUIP, INC. TITLED "PLOT PLAN BURTON FLATS PLANT" DATED 4-27-77.

DATE	NO.	REVISION	BY

Amoco Production Company
Burton Flats Gas Plant
Carlsbad, New Mexico

G&E
ENGINEERING, INC.
ENVIRONMENTAL CONSULTANTS

SITE PLAN

Fig. No.

ATTACHMENT 9

BURTON FLAT GAS PLANT
GROUNDWATER MONITOR WELLS

SAMPLE LOCATION	SAMPLE DEPTH	DRILL CUTTINGS TPH - PPM	WATER SAMPLE TPH - PPM	WATER SAMPLE BENZENE	WATER SAMPLE TOLUENE	WATER SAMPLE ETHYLBENZENE	WATER SAMPLE XYLENE
Groundwater MW #1	1'	84	TNT	ND	ND	ND	ND
	5'	35					
	20'	30					
	25'	28					
Groundwater MW #2	1'	168	TNT	ND	ND	ND	ND
	5'	44					
	20'	47					
	60'	50					
Groundwater MW #3	1'	83	TNT	ND	ND	ND	ND
	5'	62					
	15'	44					
	20'	43					

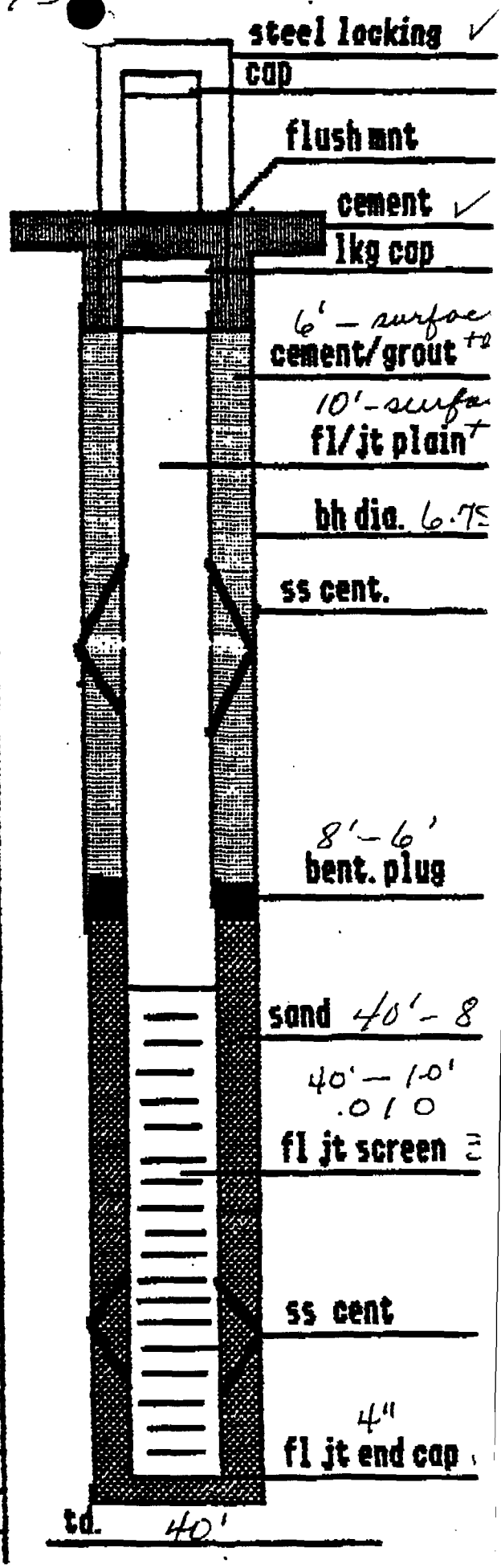
TNT = Test Not Taken
ND = Non Detectable At Or Above 0.001 mg/l

ATTACHMENT 10

CUSTOMER: Amoco DATE: 8-11-93

LOCATION: Burton Flats Gas Plant WELL #: 1

DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM
Topsoil	0	4					1	0
Red clay rock	4	7					5	0
Red clay	7	40					10	0
							15	0
							20	0
							25	0
							30	0
							35	0
							40	0

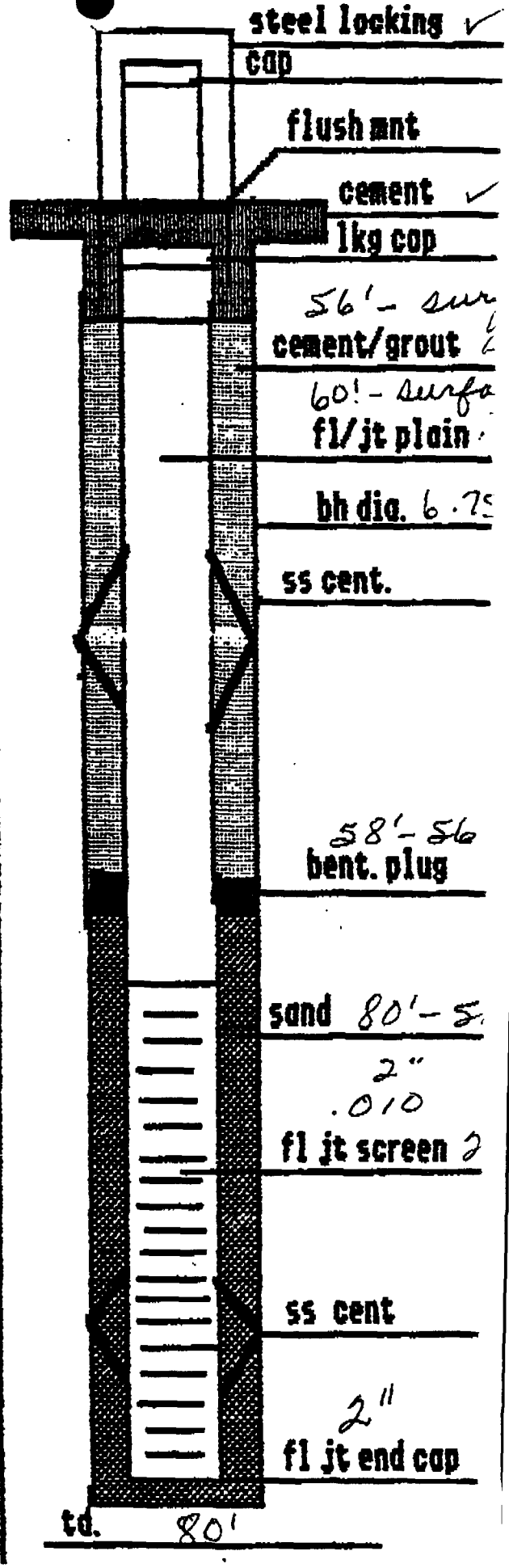


ATTACHMENT 11

CUSTOMER: Unmore DATE: 1-28-94

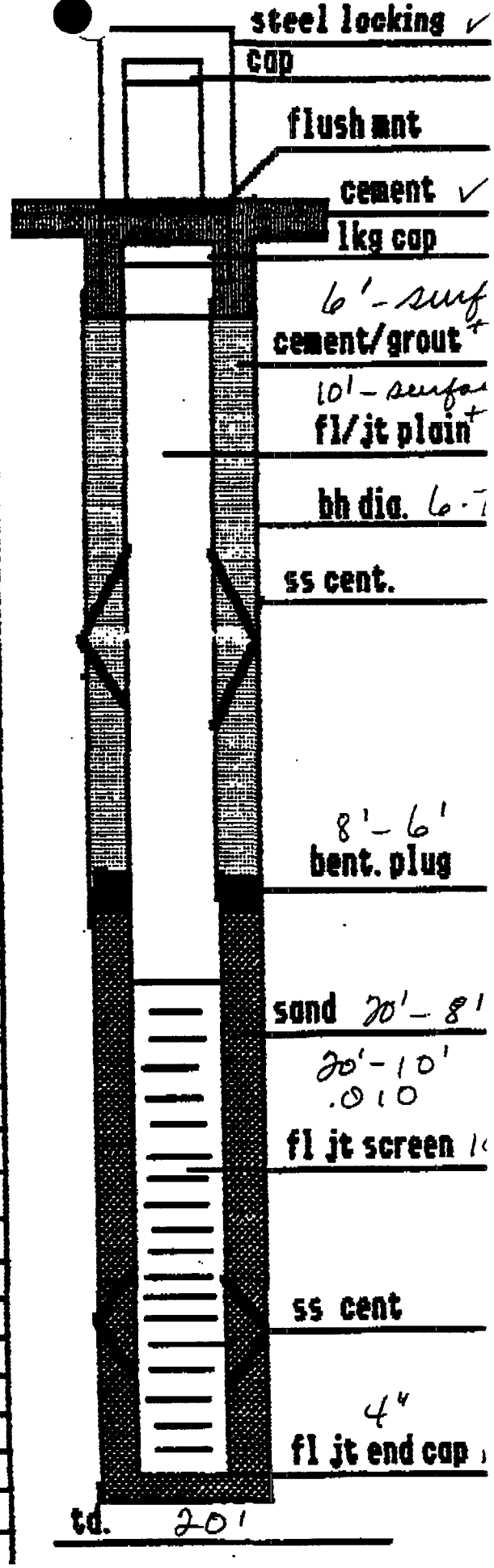
LOCATION: BFGP WELL #: 2

DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM
Top soil	0	2					1	0
Red clay ~~Caystalized~~ Gypsum	2	14					5	0
Wetred clay	14	19					10	0
Dryred clay	19	35					15	0
Blue clay	35	36					20	0
Red clay	36	64					25	0
Red sand	64	90					60	0
							80	0



LOCATION: BFGP WELL #: 3

DESRIPTION	FT.	FT.	START	STOP	SB	SB	OVM FT.	PPM
Topsoil	0	10					1	0
Red clay/ gypsum	10	13					5	0
Red clay	13	20					10	0
							15	0
							20	0



ATTACHMENT 12

BURTON FLATS GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER:	1		
TOTAL DEPTH OF WELL:	43	TOP OF SCREEN:	13
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	43

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX
3/2/93		ND	ND	ND	ND	ND
9/23/93	33	ND	ND	ND	ND	ND
12/8/93	36.30	ND	ND	ND	ND	ND
3/15/94	33.86	ND	ND	ND	ND	ND

ALL MEASUREMENTS ARE FROM TOP OF CASING

BURTON FLATS GAS PLANT
MONITOR WELL INFORMATION SUMMARY

MONITOR WELL NUMBER: 2
TOTAL DEPTH OF WELL: 81.5
WATER WELL DRILLER: EADES
TOP OF SCREEN: 61.5
BASE OF SCREEN: 81.5

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX
3/2/93		ND	ND	ND	ND	ND
9/23/93	36	ND	ND	ND	ND	ND
12/8/93	37.48	ND	ND	ND	ND	ND
3/15/94	36.8	ND	ND	ND	ND	ND

ALL MEASUREMENTS ARE FROM TOP OF CASING

BURTON FLATS GAS PLANT
MONITOR WELL INFORMATION SUMMARY

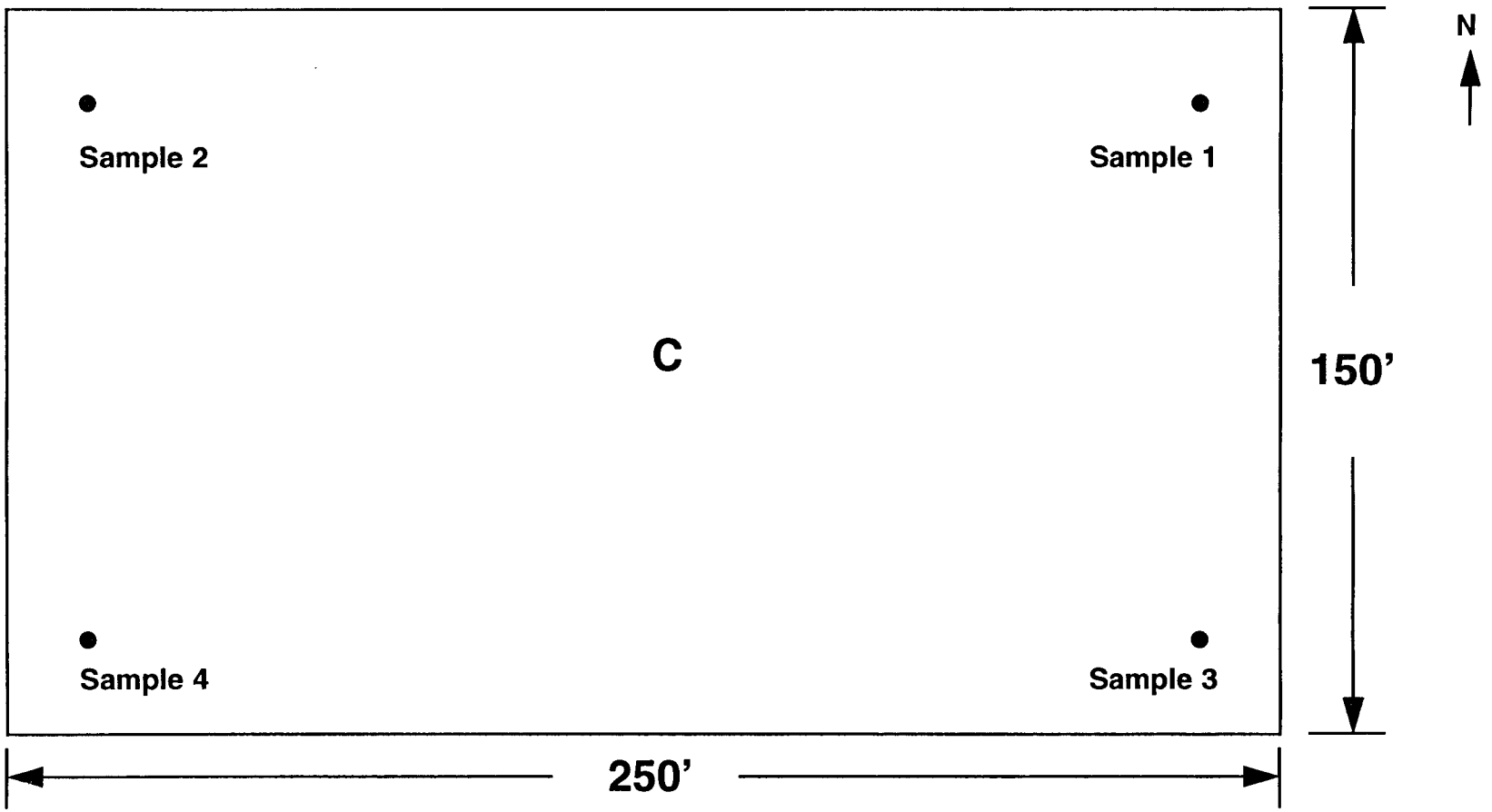
MONITOR WELL NUMBER:	3		
TOTAL DEPTH OF WELL:	25.3	TOP OF SCREEN:	15.3
WATER WELL DRILLER:	EADES	BASE OF SCREEN:	25.3

WATER SAMPLE ANALYSIS; mg/l

DATE	WATER LEVEL	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE M.P.O.	TOTAL BTEX
3/2/93		ND	ND	ND	ND	ND
9/23/93	20	ND	ND	ND	ND	ND
12/8/93	15.20	ND	ND	ND	ND	ND
3/15/94	15.23	ND	ND	ND	ND	ND

ALL MEASUREMENTS ARE FROM TOP OF CASING

BURTON FLATS GAS PLANT
SOIL REMEDIATION



#1 = 7840 mg/kg
#2 = 5475 mg/kg

#3 = 6805 mg/kg
#4 = 1892 mg/kg
C= 1815 mg/kg

Sampled 6/17/94

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co. Date: 6/20/94
Address: P.O. Box 67 Lab #: H1787
City, State: Hobbs, NM 88241-0067

Project Name:
Location: Burton Flats Gas Plant
Sampled by: CC Date: 6/17/94 Time: not given
Analyzed by: HM Date: 6/18/94 Time: 11:30
Sample Type: Soil Sample Condition: BIST Units: mg/kg

Samp #	Field Code	TRPHC
1	BFEP Remediation Area NE 7' inside 6" deep	7,840
2	" " " NW 7' inside 6" deep	5,475
3	SE Side - Remediation Area #3 - 6" deep	6,882
4	SW Side - " " BFEP 6" deep	1,892
5	BFEP Remediation Area Mid 6" deep	1,815
	QC Recovery	416.9
	QC Spike	485.9
	Accuracy	102.7%
	Air Blank	0.0

Methods - INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 418.1, 3540 OR 3510

Michael R. Fowler

6-20-94
Date

Amoco Production Company
South Permian Basin
Business Unit
501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

G. D. Henry
Manager, Environment,
Health and Safety

April 14, 1994

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
P. O. Box 2088
State Land Office Building
Santa Fe, New Mexico 87504

Attention: Mr. William J. LeMay, Director

File: GDH-2190-988.GW00

Discharge Plan GW-013
Burton Flats Gasoline Plant
Eddy County, New Mexico

As requested in your letter of April 4, 1994, we are providing a copy of the Phase II environmental assessment performed prior to the purchase of the plant by Amoco.

Please contact Karl McGinnis at (713) 366-7362 if additional information is required.

Sincerely,

G. D. Henry

KLM

Enclosures

cc: NMOCD District II, 811 South First Street,
P. O. Drawer DD, Artesia, NM 88210

BURTON FLAT GAS PLANT

Soil Sampling

Soil sampling was conducted at Triton's Burton Flats Gas Processing Plant by Scott Neumann and Tom Scott of the EH&S Department of the SPBBU on February 17-18, 1993. Soil sampling was conducted around various equipment at the plant. Split samples were taken (hand auger) to utilize both the portable TPH analyzer onsite and Cardinal Labs in Hobbs, New Mexico. Soil sampling was also conducted on the drill cuttings from the three groundwater monitoring wells that were drilled. Samples from the drill cuttings were analyzed for TPH offsite. All samples both onsite and those shipped to Cardinal Labs were kept in an ice chest at a temperature below 40° F. Samples onsite were kept in plastic freezer bags while those shipped to Cardinal Labs were submitted in 4 ounce glass jars. The following is a summary of sample locations and depths at the gas plant.

1. Vent Stack

   Four samples were taken at depth intervals of 6", 18", and 30". Each sample depth was composited onsite. Sample 1 was taken 2' southeast of the vent stack, Sample 2 was taken 8'2" east of the vent stack, Sample 3 was taken 8'9" south of the vent stack and Sample 4 was taken 9'9" northwest of the vent stack.

   * Sample 3 had only 2 sample depths due to finding underground line after 18".

2. Compressor Station

   One sample was taken at depth intervals of 6", 18", and 30". No compositing due to only one sample being taken. The sample was taken at 2' from the northwest corner of the compressor concrete pad.

3. Slop Oil Tank Area

   Two samples were taken at depth intervals of 6", 18", 30", and 48". Each sample depth was composited onsite. Sample 1 was taken 2' southwest of the slop oil tank, and sample 2 was taken 3' northeast of the slop oil tank.

4. Dehydration Area

   Three samples were taken at depth intervals of 6", and 18". Each sample depth was composited onsite. Sample 1 was taken 15' south of the scrubber, Sample 2 was taken at 23'3" northeast of the scrubber, and sample 3 was taken 21' northeast of the dehydration unit.

5. Process Area

   Two samples were taken at depth intervals of 6", 18" and 30". Each sample depth was composited onsite. Sample 1 was taken 24" east of the Process area, and Sample 2 was taken 12" north of the east engine pump.

6. Chemical Storage Area

   Three samples were taken at depth intervals of 6", and 18'. Each sample depth was composited onsite. Sample 1 was taken 12" west of the northwest corner of the concrete containment pad, Sample 2 was taken 12" north of the northeast corner of the concrete containment pad, and Sample 3 was taken 12" south of the southeast corner of the concrete containment pad.

7. Groundwater Monitoring Well #1

   Five samples were taken at depths of 1', 5', 20', and 35'. Well bore located approximately 36' from the southeast corner of the overrun pit.

8. Groundwater Monitoring Well #2

   Four samples were taken at depths of 1', 5', 20', and 60'. Well bore located approximately 5' north northeast of compressor building.

9. Groundwater Monitoring Well #3

   Four samples were taken at depths of 1', 5', 15', and 20'. Well bore located approximately 30' south southwest of compressor building.

BURTON FLATS GAS PLANT
SOIL SAMPLING DATA

SAMPLE LOCATION	SAMPLE DEPTH	LAB TPH (PPM)	OVM READING
Vent Stack	6"	743	2
	18"	N/A	0
	30"	31411	0
Compressor Station	6"	N/A	0
	18"	N/A	0
	30"	183	0
Slop Oil Tank	6"	N/A	22
	18"	21335	18
	30"	24165	118
	48"	15183	33/146
Dehydration Area	6"	N/A	0
	18"	43.7	0
Process Area	6"	29163	29
	18"	N/A	58
	30"	11774	77
Chemical Storage A	6"	731.5	8
	18"	547	4

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TEXAS 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co.
Address: P.O. Box 3092
City, State: Houston, TX 77250-3092

Date: 2/22/93
Lab#: H1155

Project Name: Empire Abo
Project Location: Artesia, NM
Sampled by: SN Date: 2/18/93 Time:
Analyzed by: MF Date: 2/20/93 Time: 12:00
Type of Samples: Soil Sample Condition: GIST Units: mg/kg, mg/l

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL BENZENE	PARA-XYLENE	META-XYLENE	ORTHO-XYLENE	MTBE
1	Comp. NE 30"	183.3	***	***	***	***	***	***	***
2	BFGP #1-1'	84.0	***	***	***	***	***	***	***
3	BFGP #1-5'	35.2	***	***	***	***	***	***	***
4	BFGP #1-20'	30.0	***	***	***	***	***	***	***
5	BFGP #1-35'	28.0	***	***	***	***	***	***	***
6	BFGP #2-1'	167.5	***	***	***	***	***	***	***
7	BFGP #2-5'	43.6	***	***	***	***	***	***	***
8	BFGP #2-20'	47.2	***	***	***	***	***	***	***
9	BFGP #2-60'	49.7	***	***	***	***	***	***	***
10	Slop O.Tnk.-18"	21,335	***	***	***	***	***	***	***
11	Slop O.Tnk.-30"	24,165	***	***	***	***	***	***	***
12	Vent Stack-30"	31,411	***	***	***	***	***	***	***
13	Vent Stack-6"	742.8	***	***	***	***	***	***	***
	QC Recovery	350.2	***	***	***	***	***	***	***
	QC Spike	336.2	***	***	***	***	***	***	***
	Accuracy	104.2%	***	***	***	***	***	***	***
	Air Blank	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Methods - AUTOMATED HEADSPACE GC; INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 8020, 418.1, 3540 OR 3510

Michael R. Fowler

Date 2/22/93

CARDINAL LABORATORIES

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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NEW MEXICO 88240

FINAL ANALYSIS REPORT

Company: Amoco Production Co.
Address: P.O. Box 3092
City, State: Houston, TX 77250-3092

Date: 2/22/93
Lab#: H1157

Project Name: Burton Flat Gas Plant
Project Location:
Sampled by: T.W. Scott Date: 2/19/93 Time:
Analyzed by: MF Date: 2/20/93 Time: 1:00
Type of Samples: Soil Sample Condition: GIST Units: mg/kg, mg/l

Samp #	Field Code	TRPHC	BENZENE	TOLUENE	ETHYL BENZENE	PARA-XYLENE	META-XYLENE	ORTHO-XYLENE	MTBE
1	BFGP #3-1'	83.4	***	***	***	***	***	***	***
2	BFGP #3-5'	62.0	***	***	***	***	***	***	***
3	BFGP #3-15'	44.2	***	***	***	***	***	***	***
4	BFGP #3-20'	42.9	***	***	***	***	***	***	***
5	BFGP S.Tnk.-48"	15,183	***	***	***	***	***	***	***
6	BFGP D.A.-18"	43.7	***	***	***	***	***	***	***
7	BFGP C.S.A.-6"	731.5	***	***	***	***	***	***	***
8	BFGP C.S.A.-18"	547.0	***	***	***	***	***	***	***
9	BFGP P.A.-6"	29,163	***	***	***	***	***	***	***
10	BFGP P.A.-30"	11,774	***	***	***	***	***	***	***
	QC Recovery	350.2	***	***	***	***	***	***	***
	QC Spike	336.2	***	***	***	***	***	***	***
	Accuracy	104.2%	***	***	***	***	***	***	***
	Air Blank	***	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Methods - AUTOMATED HEADSPACE GC; INFRARED SPECTROSCOPY
- EPA SW-846; EPA METHODS 8020, 418.1, 3540 OR 3510

Michael R. Fowler

Date 2/22/93

BURTON FLAT GAS PLANT
GROUNDWATER MONITOR WELLS

SAMPLE LOCATION	SAMPLE DEPTH	DRILL CUTTINGS TPH - PPM	WATER SAMPLE TPH - PPM	WATER SAMPLE BENZENE	WATER SAMPLE TOLUENE	WATER SAMPLE ETHYLBENZENE	WATER SAMPLE XYLENE
Groundwater W #1	1'	84	TNT	ND	ND	ND	ND
	5'	35					
	20'	30					
	35'	28					
Groundwater W #2	1'	168	TNT	ND	ND	ND	ND
	5'	44					
	20'	47					
	60'	50					
Groundwater W #3	1'	83	TNT	ND	ND	ND	ND
	5'	62					
	15'	44					
	20'	43					

TNT = Test Not Taken
ND = Non Detectable At Or Above 0.001 mg/l

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Burton Flats Gas Plant, New Mexico

Lab.# 93W0237 Method: Amoco Modified 8015

Date sampled: 03/02/93 Date received: 03/05/93

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL
Burton Flat 1	ND	ND	ND	ND	ND
Burton Flat 2	ND	ND	ND	ND	ND
Burton Flat 3	ND	ND	ND	ND	ND

NOTES:

1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylene.
4. Reporting limit for benzene, toluene, ethybenzene and each xylene is 0.001 mg/L.

Sampled by: APC - R. Carey Cook

Date analyzed: 03/08/93 Checked by: T. G. Miller

SAC:sac
93074HOA0060 March 15, 1993

CITIES SERVICE COMPANY
BOX 300
TULSA, OKLAHOMA 74102

May 15, 1979

New Mexico Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88240

Attention: Mr. Eddie Seay

Dear Mr. Seay

Attached are the data you requested on your pits, ponds, and lagoons survey, for Cities Service Company's Bluitt Gas Processing Plant, Milnesand, New Mexico.

If you have any questions or need additional information, please contact me.

Very truly yours,

NATURAL GAS LIQUIDS DIVISION

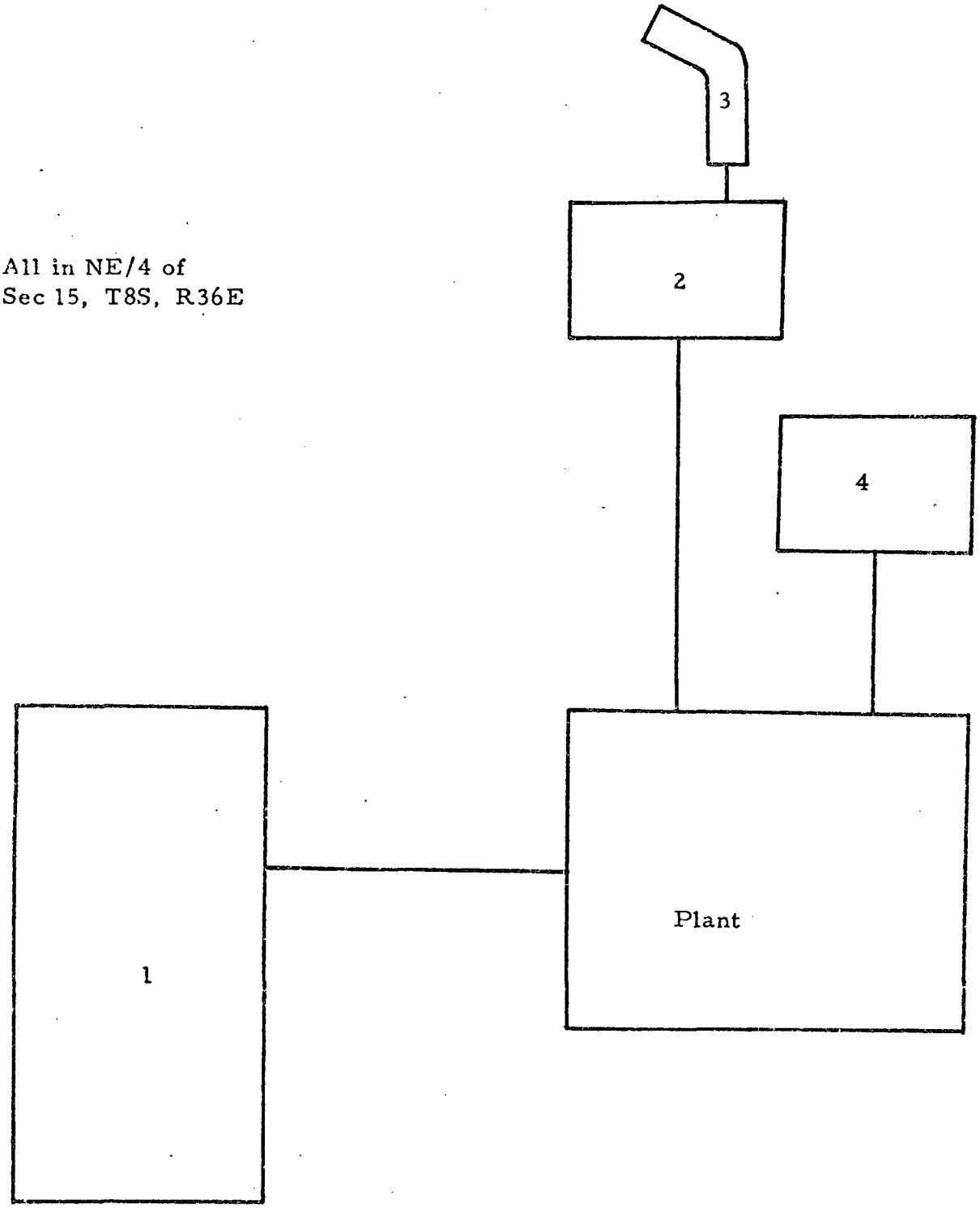
J. W. Horn
Manager, Central Region

JWH:blr

Attachments

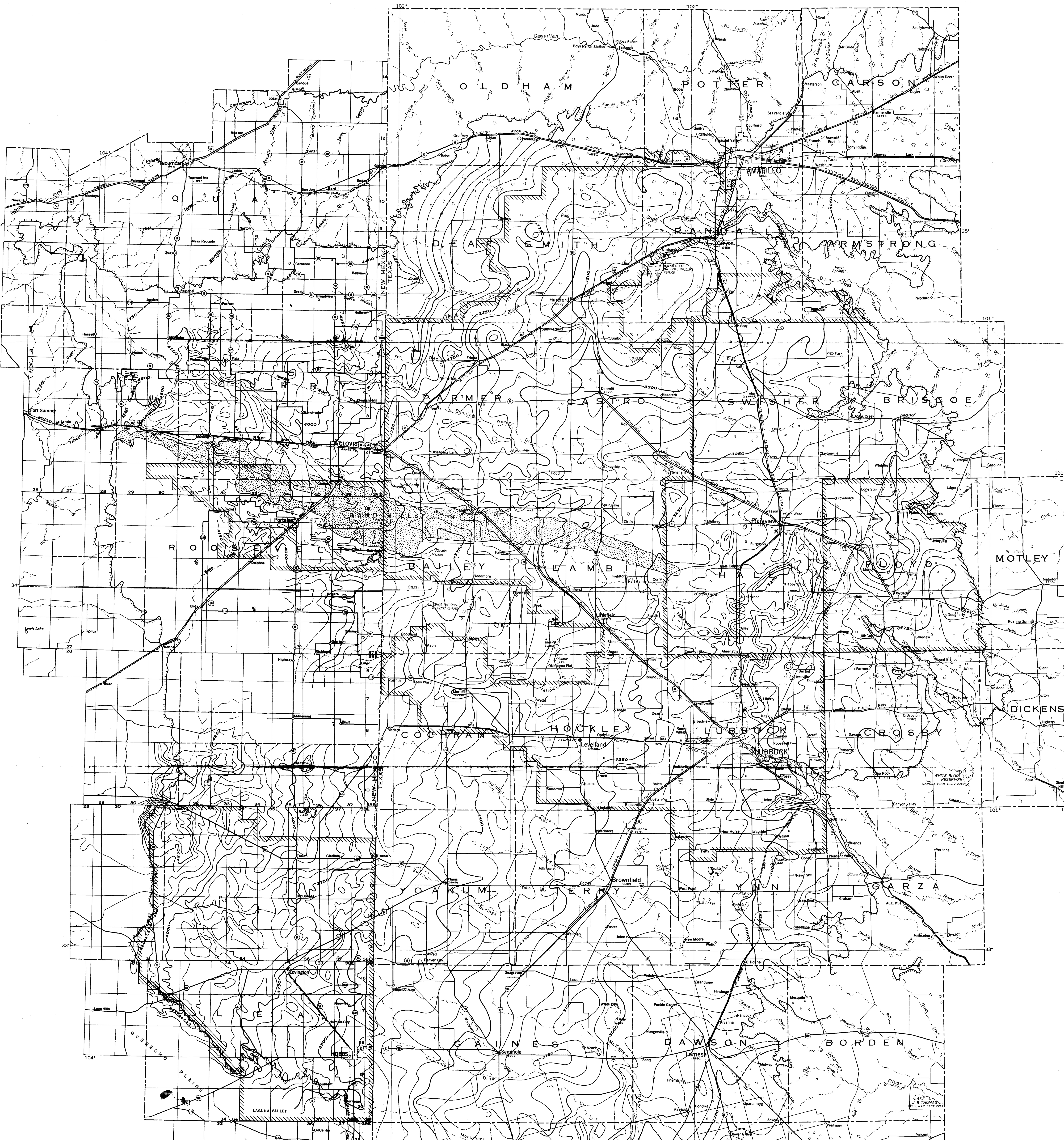
5/13/79

All in NE/4 of
Sec 15, T8S, R36E

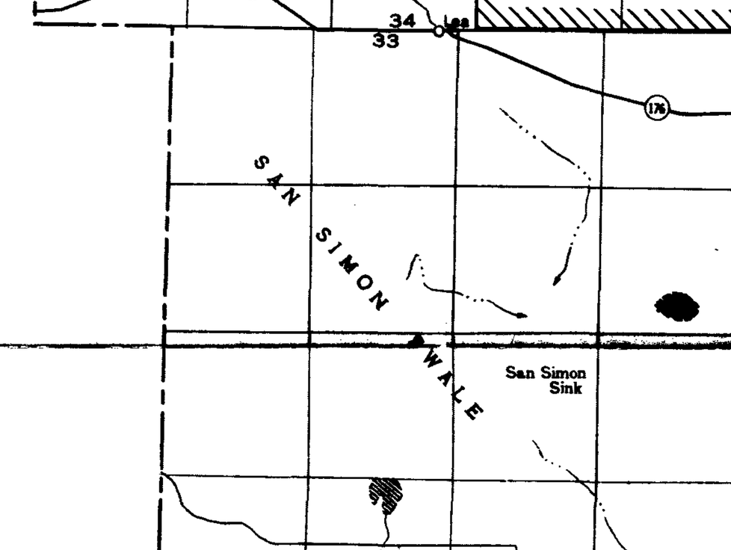


Lagoon	No. 1	No. 2	No. 3	No. 4
Length (Ft)	173	35	70	22
Width (Ft)	50	22	6	18
Average Depth (Ft)	7.5	6	6	2
Lining Material	NONE	NONE	NONE	NONE
Annual Volumes (Gal/Yr)	14,716,800	14,085----►	Overflow	26,000
Phosphate (PO_4)	68	6.2	"	0
P-Alkanlinity	140	------	------	0
M-Alkalinity	1600	------	------	132
Chloride (CL)	230	------	------	90
Sulfate (SO_4)	1300	------	------	190
Chromium (Cr)	10.1	0.9	"	0
Silica (SiO_2)	178	------	------	36
Zinc (Zn)	8.75	0.05	"	0
Phosphorus (P)	29.9	0.35	"	------
Total Hardness (C_aCO_3)	480	------	------	390
Sodium (Na)	1287	------	------	33
T D S	4740	------	------	630
Conductivity (Micromhos)	5000	------	------	850
pH	8.6	------	------	7.0
Oil & Grease	16.5	5.5	"	0

*Analyses results in ppm unless otherwise stated



Base from U.S. Geological Survey State maps New Mexico, 1955; Texas, 1965



AREA OF THIS REPORT

SCALE 1:500 000

DATUM IS MEAN SEA LEVEL

Modified and adapted from S. E. Galloway, 1956; J. B. Cooper, 1960; Alexander Nicholson, Jr. and Alfred Clebsch, Jr., 1961; S. R. Ash, 1963; J. G. Cronin, 1964; C. F. Berkstresser, Jr. and W. A. Mourant, 1966; P. L. Rettman and E. R. Leggat, 1966, and unpublished maps from New Mexico State Engineer's Office by S. E. Galloway and R. L. Borton

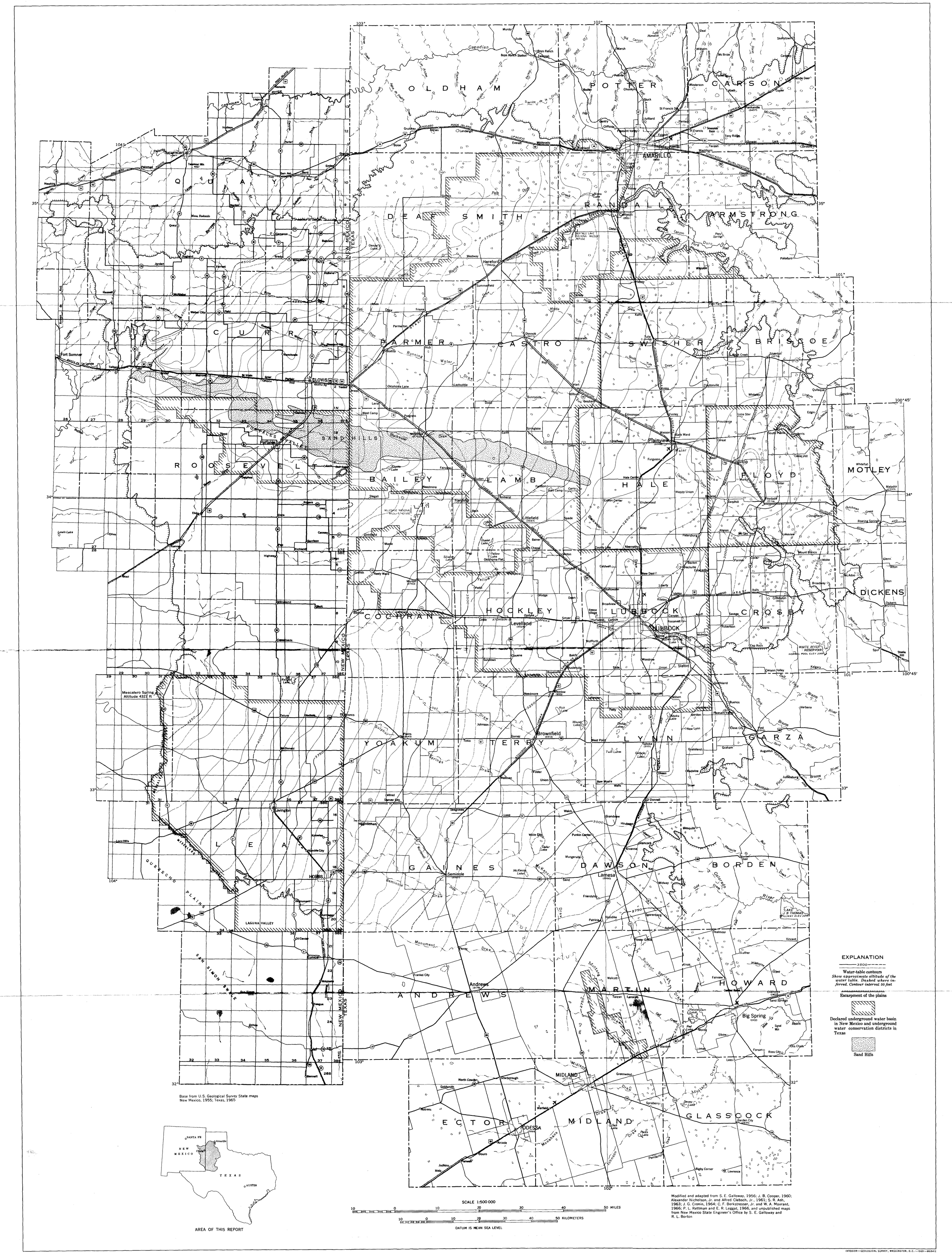
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1969—W68412

Map showing approximate altitude of the base of the Ogallala Formation

GROUND WATER IN THE OGALLALA FORMATION IN THE SOUTHERN HIGH PLAINS OF TEXAS AND NEW MEXICO

By
James G. Cronin
1969

For sale by the U.S. Geological Survey, price $1.50 per set
Explanatory pamphlet accompanies map



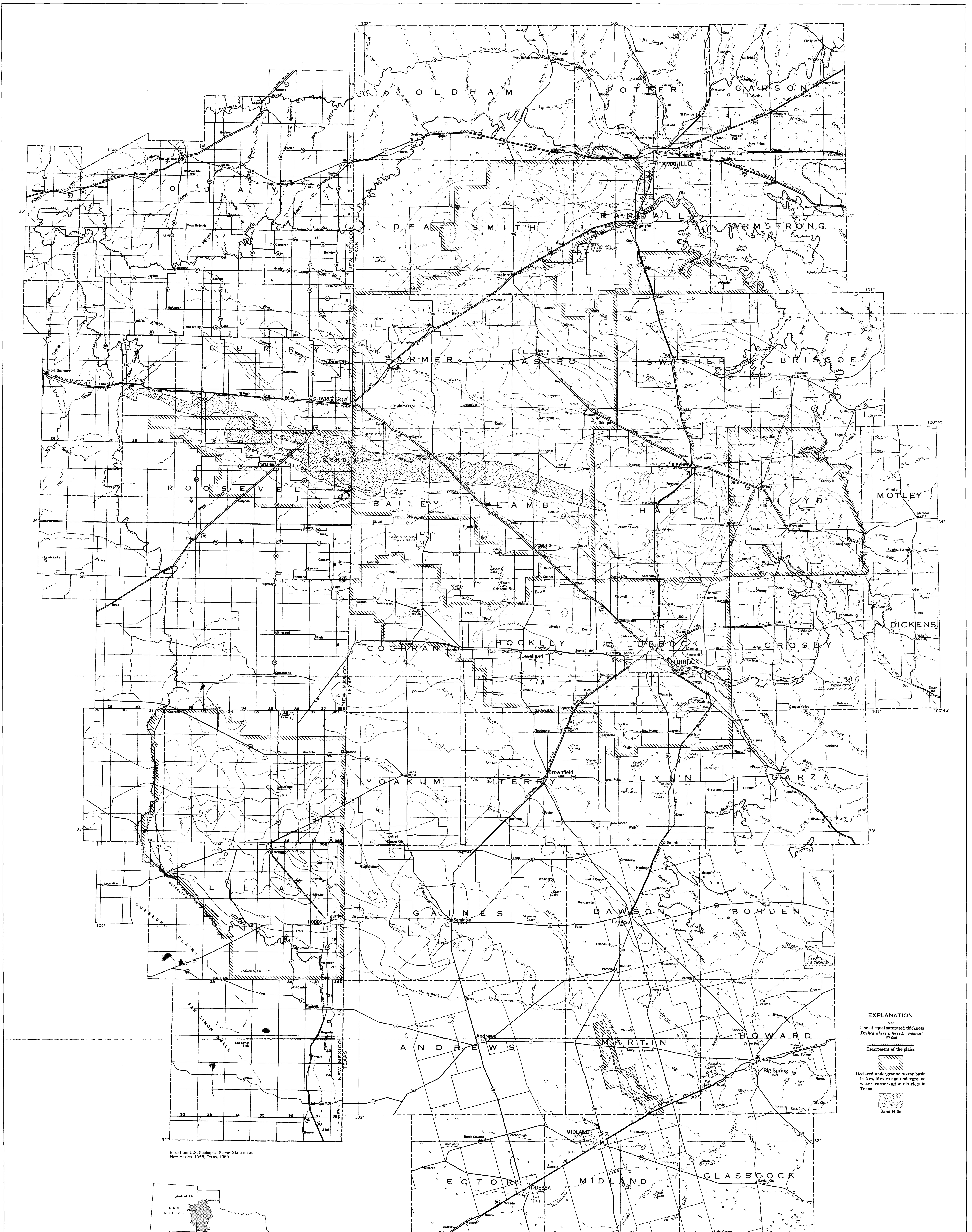
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1969—W68412

Map showing approximate altitude of the water table, 1967

GROUND WATER IN THE OGALLALA FORMATION IN THE SOUTHERN HIGH PLAINS OF TEXAS AND NEW MEXICO

By
James G. Cronin

1969



Map showing approximate saturated thickness of the Ogallala Formation, 1967

GROUND WATER IN THE OGALLALA FORMATION IN THE SOUTHERN HIGH PLAINS OF TEXAS AND NEW MEXICO

By
James G. Cronin

1969