Appendix F - SPCC Plan

SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN

Wynnewood Refining Company, LLC
906 South Powell Avenue
Wynnewood, Garvin County, Oklahoma 73098

July 27, 2015

Prepared For:
Wynnewood Refining Company, LLC
Wynnewood, Oklahoma

ENGlobal Project No. 10-130458
A&M Project No. 2152-006

Prepared By:

ENGlobal
Engineering and Construction Services, Inc.
2448 East 81st Street, Suite 3300
Tulsa, Oklahoma 74137-4288
Phone (918) 270-1171 & Fax (918) 270-1177

and

A & M Engineering and Environmental Services, Inc.
10010 East 16th Street
Tulsa, Oklahoma 74128-4813
Phone (918) 665-6575 & Fax (918) 665-6576

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

Section **Title** **Page**

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF APPENDICIES

ACRONYMS AND ABBREVIATIONS

API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
AST	Aboveground Storage Tank
Bbls	Barrels
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	*Code of Federal Regulations*
DOI	United States Department of Interior
DOT	United States Department of Transportation
EPCRA	Emergency Planning and Community Right-to-Know Act
ERC	Emergency Response Coordinator
FCCU	Fluid Catalytic Cracking Unit
FEMA	Federal Emergency Management Agency
FRP	Facility Response Plan
FWPCA	Federal Water Pollution Control Act
GIS	Geographic Information Systems
HMTA	Hazardous Materials Transportation Act
JP-8	Military Jet Fuel
kVA	Kilovolt Amperes
LACT	Lease Automatic Custody Transfer
LEPC	Local Emergency Planning Committee
LPG	Liquefied Petroleum Gas
LSR	Light Straight Run
LUA	Loading and Unloading Area
LUR	Loading and Unloading Rack
MOU	Memorandum of Understanding
MSA	Material Storage Area
NAICS	North American Industrial Classification System
NGL	Natural Gas Liquids
NRC	National Response Center

ACRONYMS AND ABBREVIATIONS (Cont'd)

ODEQ	Oklahoma Department of Environmental Quality
OPDES	Oklahoma Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Act
PE	Professional Engineer
PMA	Polymer Modified Asphalt
PMSA	Portable Material Storage Area
RA	Regional Administrator
SARA	Superfund Amendments and Reauthorization Act
SERC	State Emergency Response Commission
SPCC	Spill Prevention, Control and Countermeasure
STI	Steel Tank Institute
SWMU	Solid Waste Management Unit
TKI	Tessenderlo-Kerley, Inc.
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
UT	Ultrasonic Testing
VTB	Vacuum Tower Bottoms
WRC	Wynnewood Refining Company, LLC

SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

1.0 Introduction

This Spill Prevention, Control and Countermeasure (SPCC) Plan (the "Plan") has been prepared to document environmental management activities implemented by Wynnewood Refining Company, LLC (WRC), located in Wynnewood, Oklahoma, to prevent oil discharges from occurring and to prepare WRC to respond in a safe, effective, and timely manner to mitigate the impacts of a discharge. The outline of this Plan follows the exact order presented in 40 C.F.R. Part 112 (Part) therefore a cross-reference of provisions is not required or provided.

This Plan identifies the following items that WRC performs to comply with the SPCC rule:

- Complete monthly and annual site inspections as outlined in Section 8.18 (Inspection, Tests, and Records) of this Plan using the inspection checklists provided in Appendix M.
- Perform preventive maintenance of equipment, secondary containment systems, and discharge prevention systems as described in this Plan to keep them in proper operating condition.
- Complete annual employee training as outlined in Section 8.19 (Personnel, Training, and Discharge Prevention Procedures) of this Plan.
- Prepare for and respond to major and minor spills as discussed in Section 8.14 (Discharge Response) of this Plan.
- Submit this Plan to the United States Environmental Protection Agency (EPA) Region 6 Regional Administrator (RA) and the Oklahoma Department of Environmental Quality (ODEQ), along with other information as discussed in Section 5.0 of this Plan, if either of the following occurs:
  - The facility discharges more than 1,000 gallons of oil into or upon the navigable waters of the U.S. or adjoining shorelines in a single spill event; or
  - The facility discharges oil in a quantity greater than 42 gallons in each of two spill events within any 12-month period.
- Review this Plan at least once every five (5) years and amend it to include more effective

prevention and control technology, if such technology will significantly reduce the likelihood of a spill event and has been proven effective in the field at the time of the review. Plan amendments, other than administrative changes, must be recertified by a Professional Engineer (PE) on the certification page (Appendix C).

- Amend this Plan within six (6) months whenever there is a change in facility design, construction, operation, or maintenance that materially affects the facility's spill potential. The revised Plan must be recertified by a PE.
- Review this Plan on an annual basis. Update the Plan to reflect any "administrative changes" that are applicable, such as personnel changes or revisions to contact information, such as phone numbers. Administrative changes must be documented in the Administrative Amendment Log (Appendix D), but do not have to be certified by a PE.

2.0 General Applicability [40 C.F.R. §112.1]

Pursuant to 40 C.F.R. §112.1(b), this Part applies to any owner or operator of a non-transportation-related onshore or offshore facility engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, or consuming oil and oil products, which due to its location, could reasonably be expected to discharge oil in quantities that may be harmful into or upon the navigable waters of the United States or adjoining shorelines, that has oil in any aboveground container and has an aggregate aboveground storage capacity greater than 1,320 U.S. gallons of oil.

WRC is required to prepare, amend, and implement a SPCC Plan based on satisfaction of the following applicability requirements.

2.1 Non-Transportation-Related Facility Engaged in Refining [40 C.F.R. §112.1(b)]

WRC owns and operates a crude oil refinery located primarily in Section 23, Township 2 North, Range 1 EIM, Garvin County, Oklahoma and secondarily in the SW¼ NE¼ NW¼ of Section 26, Township 2 North, Range 1 EIM, Murray County, Oklahoma or at 906 South Powell Ave., Wynnewood, Oklahoma 73098.

Crude oil is transported to the refinery via two separate third-party pipelines and is received into storage tanks located at or near the refinery. Some crude oil is received by truck. The refinery yields the following products: LPGs, gasoline, diesel fuel, asphalt, jet fuel and other products (slurry, sulfur and gas oil, and specialty products such as propylene and solvents). A refinery block flow diagram, plot plan and crude/product lines routing and location diagram are shown as Figures 1, 2 and 3, respectively, in Appendix A.

Tessenderlo-Kerley, Inc. (TKI) owns and operates an ammonium thiosulfate fertilizer plant located on WRC property (Figures 4 and 5 of Appendix B). TKI is, however, excluded from this Plan for purposes of SPCC compliance. WRC will coordinate with TKI regarding the identification and response to any oil spills from either facility.

WRC is bordered on the north by the City of Wynnewood, on the east by State Highway 77, on the south by State Highway 17A and on the west by North 3270 Road. A railroad traverses the central section of the site from north to south.

2.2 Reasonable Expectation to Discharge Oil to Navigable Waters or Adjoining Shorelines in Quantities that May Be Harmful [40 C.F.R. §112.1(b)]

2.2.1 Surface Water Characteristics

The Washita River, a perennial stream, is located approximately 1 ¼ miles west of the site (Figure 4 of Appendix B). West Sandy Creek, an intermittent stream, is located west and immediately adjacent to a non-process area of the refinery property. An unnamed tributary to Turkey Sandy Creek, an intermittent stream, traverses the property beginning in the northeast corner passing to the south and west and exiting the site in the south central section of the site. Neither West Sandy Creek, the unnamed tributary of Turkey Sandy Creek nor the Washita River are designated as an Outstanding Resource Water, High Quality Water or a Sensitive Water Supply in Appendix A of the Oklahoma Water Quality Standards. No natural ponds or wetlands are located within the site.

WRC sits, in part, in the “approximate” Zone A of the 100-year flood plain (Figures 6 and 7 of

Appendix B). Zone A is qualified as “approximate” since the Federal Emergency Management Agency (FEMA) has not completed a detailed study of the flood plain beyond the southern edge of Garvin County. As a result, delineation of the 100-year flood plain beyond the limits of the detailed study is identified as “approximate”.

In the eastern portion of the site, Zone A of the 100-year flood plain follows the path of the unnamed tributary of Turkey Sandy Creek. In the western portion of the site, Zone A of the 100-year flood plain follows the path of West Sandy Creek. No part of the site is located in a designated floodway.

Surface runoff generally follows surface topography and generally travels from northeast to southwest across the area (Figure 8 of Appendix B).

2.2.2 Groundwater Characteristics

The site is underlain by the Washita River aquifer, a major alluvial aquifer. Depth to groundwater is reported to range from approximately 5 feet in the western section of the site to 17 feet in the eastern section of the site. Since groundwater tends to follow surface topography, it is inferred that groundwater generally travels from northeast to southwest beneath the site.

2.2.3 Soil and Geology Characteristics

Approximately one-third of the site soil is classified as Urban Land (process area). The remaining two-thirds of the site soils are predominantly characterized as Teller Loam (Figure 9 of Appendix B).

Site geology is described as alluvium (Figure 10 of Appendix B). The site does not contain any sinkholes, shallow limestone formations or Karst conditions. The Oklahoma Department of Environmental Quality Geographic Information System (GIS) database viewer shows no earthquake faults near the site.

2.3 Aboveground Oil Storage Capacity Exceeding 1,320 U.S. Gallons [40 C.F.R. §112.1(d)(2)(ii)]

WRC's reported oil storage capacity is summarized in Table 1 below. Detailed storage tank inventories are provided in Appendix F.

Table 1

WRC Oil Storage Capacity

Container Type	Capacity, Bbls	Contents	Description
Aboveground Bulk Storage	2,766,647	(1)	(1)
Mobile/Portable Bulk Storage	3,047	(2)	(2)
Underground Bulk Storage	0	N/A	N/A
Oil-Filled Electrical Equipment	5	(3)	(3)
Oil-Filled Operating Equipment	21	(4)	(4)
Oil-Filled Manufacturing Equipment	34,428	(5)	(5)
Mobile Refueler	0	N/A	N/A
Motive Power Container	0	N/A	N/A
Total Oil Storage Capacity: 2,804,148 Barrels			

[1] Table 6 of Appendix F.
[2] Table 7 of Appendix F
[3] Table 8 of Appendix F.
[4] Table 9 of Appendix F.
[5] Table 10 of Appendix F.

The following storage capacity is not considered in determining applicability of SPCC requirements:

- Equipment subject to the authority of the U.S. Department of Transportation, U.S. Department of the Interior, or Minerals Management Service, as defined in Memoranda of Understanding dated November 24, 1971, and November 8, 1993; Tank trucks that return to an otherwise regulated facility that contain only residual amounts of oil (EPA Policy letter);
- Completely buried tanks subject to all the technical requirements of 40 C.F.R. Part 280 or a state program approved under 40 C.F.R. Part 281;

- Any facility or part thereof used exclusively for wastewater treatment (production, recovery or recycling of oil is not considered wastewater treatment); (This does not include other oil containers located at a wastewater treatment facility, such as generator tanks or transformers);
- Containers smaller than 55 U.S. gallons;
- Permanently closed containers (as defined in §112.2);
- Motive power containers (as defined in §112.2);
- Hot-mix asphalt or any hot-mix asphalt containers;
- Pesticide application equipment and related mix containers;
- Intra-facility gathering lines subject to the regulatory requirements of 40 C.F.R. Part 192 or 195.

2.4 Purpose and Scope [40 C.F.R. §112.1(e)]

The purpose of this Plan is to form a comprehensive spill prevention program which WRC shall use to minimize the reasonable potential for discharging oil in quantities that may be harmful into or upon navigable waters of the United States or adjoining shorelines and to prepare WRC to respond in a safe, effective, and timely manner to mitigate the impacts of any discharge.

This Plan has been prepared to meet the requirements of 40 C.F.R. Part 112, and supersedes any earlier Plan developed to meet provisions in effect since 1974.

In addition to fulfilling the requirements of 40 C.F.R. Part 112, this Plan is a reference for oil storage and containment information; a tool to communicate practices on preventing and responding to discharges with employees; a guide to periodic training programs; and a guide to facility inspections.

3.0 Definitions [40 C.F.R. §112.2]

Bulk Storage Container means any container used to store oil. These containers are used for purposes including, but not limited to, the storage of oil prior to use, while being used, or prior to further distribution in commerce. Oil-filled electrical, operating, or manufacturing equipment is not a bulk storage container.

Completely Buried Tank means any container completely below grade and covered with earth, sand, gravel, asphalt, or other material. Containers in vaults, bunkered tanks, or partially buried tanks are considered aboveground storage containers for purposes of this part.

Facility means any mobile or fixed, onshore or offshore building, property, parcel, lease, structure, installation, equipment, pipe, or pipeline (other than a vessel or a public vessel) used in oil well drilling operations, oil production, oil refining, oil storage, oil gathering, oil processing, oil transfer, oil distribution, and oil waste treatment, or in which oil is used, as described in Appendix A to this part. The boundaries of a facility depend on several site specific factors, including but not limited to, the ownership or operation of buildings, structures, and equipment on the same site and types of activity at the site. Contiguous or non-contiguous buildings, properties, parcels, leases, structures, installations, pipes, or pipelines under the ownership or operation of the same person may be considered separate facility. On this definition governs whether a facility is subject to this part.

Loading/Unloading Rack means a fixed structure (such as a platform, gangway) necessary for loading or unloading a tank truck or tank car, which is located at a facility subject to the requirements of this part. A loading/unloading rack includes a loading or unloading arm, and may include any combination of the following: piping assemblages, valves, pumps, shut-off devices, overfill sensors, or personnel safety devices.

Mobile Refueler means a bulk storage container onboard a vehicle or towed, that is designed or used solely to store and transport fuel for transfer into or from an aircraft, motor vehicle, locomotive, vessel, ground service equipment, or other oil storage container.

Motive Power Container means any onboard bulk storage container used primarily to power the movement of a motor vehicle or ancillary onboard oil-filled operation equipment. An onboard bulk storage container which is used to store or transfer oil for further distribution is not a motive power container. The definition of motive power container does not include oil drilling or workover equipment, including rigs.

Navigable Waters of the United States means “navigable waters” as defined in section 501(7) of the FWPCA, and includes: (1) all navigable waters of the United States, as defined in judicial decisions prior to passage of the 1972 Amendments to the FWPCA (Pub. L. 92-500), and tributaries of such waters; (2) interstate waters; (3) intrastate lakes, rivers, and streams which are utilized by interstate travelers for recreational or other purposes; and (4) intrastate lakes, rivers, and streams from which fish or shellfish are taken and sold in interstate commerce.

Oil means oil of any kind or in any form, including, but not limited to: fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and, other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.

Oil-Filled Operational Equipment means equipment that includes an oil storage container (or multiple containers) in which the oil is present solely to support the function of the apparatus or the device. Oil-filled operational equipment is not considered a bulk storage container, and does not include oil-filled manufacturing equipment (flow-through process). Examples of oil-filled operational equipment include, but are not limited to, hydraulic systems, lubricating systems (e.g., those for pumps, compressors and other rotating equipment, including pump jack lubrication systems), gear boxes, machining coolant systems, heat transfer systems, transformers, circuit breakers, electrical switches, and other systems container oil solely to enable the operation of the device.

Owner or Operator means any person owning or operating an onshore facility or an offshore facility, and in the case of any abandoned offshore facility, the person who owned or operated or maintained the facility immediately prior to such abandonment.

Permanently Closed means any container or facility for which:

- All liquid and sludge has been removed from each container and connecting line; and
- All connecting lines and piping have been disconnected from the container and blanked off, all valves (except for ventilation valves) have been closed and locked, and conspicuous signs have been posted on each container stating that it is a permanently closed container and noting the date of closure.

Spill Prevention, Control, and Countermeasure Plan; SPCC Plan, or Plan means the document required by §112.3 that detail the equipment, workforce, procedures, and steps to prevent, control, and provide adequate countermeasures to a discharge.

Storage Capacity of a Container means the shell capacity of the container.

4.0 Requirement to Prepare and Implement a SPCC Plan [40 C.F.R. §112.3]

This written SPCC Plan has been prepared for implementation at the WRC facility in accordance with the requirements of 40 C.F.R. §112.7 and any other applicable section of this Part.

4.1 Requirement to Maintain and Implement an Amended Plan No Later Than November 10, 2011 [40 C.F.R. §112.3(a)]

WRC prepared and implemented a Spill Prevention, Control, and Countermeasure Plan on 09/30/03, which superseded prior editions of the Plan. A Plan review in 2008 determined that no amendments were needed. The most recent amendment process began in fall 2013.

4.2 Professional Engineer Certification [40 C.F.R. §112.3(d)]

A licensed Professional Engineer must review and certify this Plan to satisfy the requirements of 40 C.F.R. Part 112. By means of this certification the Professional Engineer attests:

- That he/she is familiar with the requirements of Part 112 of Title 40 of the *Code of Federal Regulations* (40 C.F.R. Part 112);

- That he/she or his/her agent has visited and examined the facility;
- That the Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and the requirements of 40 C.F.R. Part 112;
- That procedures for required inspections and testing have been established; and
- That the Plan is adequate for the facility.

The engineering certification shall in no way relieve the owner or operator of this facility of their duty to prepare and fully implement the Plan in accordance with the requirements of 40 C.F.R. Part 112.

The Professional Engineer Certification for this Plan is shown in Appendix C.

4.3 Plan Location and Availability [40 C.F.R. §112.3(e)(1)]

A complete copy of this Plan is to be maintained at the facility in the main office building. The main office is attended 7:30 a.m. to 4:00 p.m. CST, 5 days per week (closed on Holidays, Saturdays and Sundays).

5.0 Spill Notifications and Amendment of SPCC Plan by Regional Administrator [40 C.F.R. §112.4]

5.1 USEPA Region 6 Written Notification [40 C.F.R. §112.4 (a)]

In the event that the facility has a discharge of more than 1,000 U.S. gallons of oil in a single event or more than 42 U.S. gallons of oil in each of two discharge events occurring within any 12 month period, WRC shall submit the following information to the USEPA Region 6 RA within 60 days:

1. Name of the facility;
2. Name and contact information of responsible person;
3. Location of the facility;
4. Maximum storage or handling capacity of the facility and normal daily throughput;

5. Corrective action and countermeasures you have taken, including a description of equipment repairs and replacements;
6. An adequate description of the facility, including maps, flow diagrams, and topographical maps, as necessary;
7. The cause of the discharge, including a failure analysis of the system or subsystem in which the failure occurred;
8. Additional preventative measures taken or contemplated to minimize possibility of recurrence; and
9. Such other information as the RA may reasonably require pertinent to the Plan or discharge.

The written report shall be submitted to the USEPA Region 6 RA at the following address:

Environmental Protection Agency, Region 6
Regional Administrator
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

5.2 State and Local Emergency Planning Commission Written Notification [40 C.F.R. §112.4 (c)]

5.2.1 Oklahoma Hazardous Materials Response Commission

In the event of a reportable discharge, as described in Section 5.1, a copy of the written report shall also be submitted to the Oklahoma Hazardous Materials Response Commission (SERC) at the following address:

Oklahoma Hazardous Materials Response Commission
Monty Elder
DEQ Customer Services
P.O. Box 1677
Oklahoma City, OK 73101-1677

5.2.2 Local Emergency Planning Commission

In the event of a reportable discharge, as described in Section 5.1, a copy of the written report shall also be submitted to the Local Emergency Planning Commission (LEPC) at the following address:

Local Emergency Planning Committee
Bud Ramming
P.O. Box 237
Paul Valley, OK 73075

Upon receipt of the information, the SERC and/or LEPC may review and make recommendations to the RA as to further procedures, methods, equipment, and other requirements necessary to prevent and to contain discharges from the facility.

5.3 Amendment of Plan by the Regional Administrator [40 C.F.R. §112.4 (d)]

The RA may require that this Plan be amended based on a review of information submitted to the RA, as a result of information submitted to USEPA by the ODEQ, or based on an on-site review of the Plan.

Plan amendments may also be required if the RA finds that the Plan does not meet the requirements of 40 C.F.R. Part 112 or that amendment is necessary to prevent and contain discharges from the facility.

5.4 Response to Request by the Regional Administrator for Plan Amendment [40 C.F.R. §112.4 (e)]

In the event that the RA issues a request that this Plan be amended, within 30 days from receipt of such notice, WRC may submit written information, views, and arguments regarding the proposed amendment. After considering all relevant material presented, the RA must either notify WRC of any amendment required or rescind the notice. In the event that the RA issues a final amendment request, WRC must amend the Plan as required within 30 days after such notice, unless the RA, for good cause, specifies another effective date. The amended Plan must be implemented as soon as possible, but not later than six months after the Plan has been amended, unless the RA specifies another date.

6.0 Amendment of SPCC Plan by Owners or Operators [40 C.F.R. §112.5]

6.1 Changes in Facility Configuration [40 C.F.R. §112.5(a)]

This Plan must be amended whenever there is a change in the facility design, construction, operation, or maintenance that materially affects the facility's potential for the discharge of oil into or upon the navigable waters of the United States or adjoining shorelines.

Examples of changes that may require amendment of the Plan include, but are not limited to: commissioning or decommissioning containers; replacement, reconstruction, or movement of containers; reconstruction, replacement, or installation of piping systems; construction or demolition that might alter secondary containment structures; changes of product or service; or revision of standard operation or maintenance procedures at the facility. The amendment must be completed within 6 months and implemented as soon as possible but not later than 6 months following the preparation of the amendment.

6.2 Scheduled Plan Reviews [40 C.F.R. §112.5(b)]

A review and evaluation of this Plan shall be completed at least once every 5 years from the original date of certification. As a result of this review and evaluation, the Plan must be amended within 6 months of the review to include more effective prevention and control technology if the technology has been field-proven at the time of review and will significantly reduce the likelihood of a discharge of oil into or upon the navigable waters of the United States or adjoining shorelines. The amendment must be implemented as soon as possible but no later than 6 months following the preparation of the amendment.

Scheduled Plan reviews are to be signed and recorded in the Five Year Review Log (Table 3 of Appendix D).

6.3 Technical Amendments [40 C.F.R. §112.5(c)]

PE Certification is required if any technical amendments are made to the Plan. Technical amendments materially affect a facility's potential to discharge oil and require the application of good engineering practice.

PE Certifications are to be recorded in the Technical Amendment Log (Table 4 of Appendix D).

7.0 Qualified Facilities Plan Requirements [40 C.F.R. §112.6(c)]

WRC has an aboveground storage capacity greater than 10,000 U.S. gallons and does not meet the Tier I or Tier II qualified facility applicability requirements.

8.0 General Requirements for SPCC Plans [40 C.F.R. §112.7]

8.1 Management Approval and Designated Person [40 C.F.R. §112.7]

The owner or operator of a facility subject to 40 C.F.R. 112 must prepare a Plan in accordance with good engineering practices. The Plan must have the full approval of management at a level of authority to commit the necessary resources to fully implement the Plan. Management must approve this Plan each time it is updated.

A record of management approval is shown in Appendix C.

8.2 Cross-Reference with SPCC Provisions [40 C.F.R. §112.7]

This Plan follows the exact order presented in 40 C.F.R. Part 112. As a result, a cross-reference of provisions is not required.

8.3 Facilities, Procedures, Methods, or Equipment Not Yet Fully Operational [40 C.F.R. §112.7]

If the Plan calls for additional facilities or procedures, methods, or equipment not yet fully operational, they must be discussed in separate paragraphs, and details of their installation and operational start-up must explain separately.

All facilities, procedures and methods are fully operational.

8.4 Facility Conformance with Applicable Requirements [40 C.F.R. §112.7(a)(1)]

WRC stores oil or oil products in quantities which require the preparation of a written SPCC Plan as set forth at 40 C.F.R. Part 112. WRC maintains and implements both a SPCC Plan and an Integrated Contingency Plan (ICP) at the facility. WRC has taken reasonable steps necessary to comply with 40 C.F.R. Part 112. The following is a list of exceptions that require implementation for continued compliance:

1. Certain secondary containment dikes have been identified as requiring repair or modification to provide sufficient containment for the entire capacity of the largest tank plus freeboard for precipitation based on a 25-year, 24-hour rainfall event. Further detail is provided in the applicable section of this SPCC Plan.

8.5 Deviations from Applicable Requirements [40 C.F.R. §112.7(a)(2)]

This Plan may deviate from selected provisions of 40 C.F.R. Part 112 as specified at 40 C.F.R. 112.7(a)(2) provided that alternative measures provide equivalent environmental protection.

Deviations from Plan requirements and corresponding equivalent environmental protection measures are described below.

8.5.1 Facility Drainage from Undiked Areas Containing Mobile/Portable Containers [40 C.F.R. §112.8(b)(3)]

Pursuant to 40 C.F.R. §112.8(b)(3), facility drainage systems from undiked areas with a potential for a discharge (such as where piping is located outside containment walls or where tank truck discharges may occur outside the loading area) are to be designed to flow into ponds, lagoons, or catchment basins designed to retain oil or return it to the facility. Catchment basins must not be located in areas subject to periodic flooding.

For drainage from undiked areas containing mobile/portable containers, WRC achieves equivalent environmental protection in the following alternate manner.

Inside the refinery process areas, discharge is to the refinery sewer system which is designed to contain and recover oil.

Where applicable, mobile/portable containers are provided with a portable secondary containment system considered to provide equivalent environmental protection which consists of a combination of daily visual inspections of the mobile/portable containers by qualified facility personnel and land-based spill response kits/equipment which minimize the reasonable potential for a discharge of oil in quantities that may be harmful to navigable waters or adjoining shorelines.

8.5.2 Integrity Testing of Mobile/Portable Containers [40 C.F.R. §112.8(c)(6)]

Pursuant to 40 C.F.R. §112.8(c)(6), each aboveground container is to be tested or inspected for integrity on a regular schedule and whenever material repairs are made. WRC must determine, in accordance with industry standards, the appropriate qualifications for personnel performing tests and inspections, the frequency and type of testing and inspections, which take into account container size, configuration, and design (such as containers that are: shop-built, field-erected, skid-mounted, elevated, equipped with a liner, double-walled, or partially buried).

All mobile/portable containers are shop-built containers and will not be tested for integrity.

Pursuant to 67 FR 47120 dated July 17, 2002, for certain smaller shop-built containers in which internal corrosion poses a minimal risk of failure; which are inspected at least monthly; and, for which all sides are visible (i.e., the container has no contact with the ground), visual inspection alone might suffice, subject to good engineering practice. In such case the owner or operator must explain in the Plan why visual integrity testing alone is sufficient and provides equivalent environmental protection.

Where applicable, mobile/portable containers are visually tested for integrity in a manner considered to be equivalent environmental protection and described as follows:

All small, shop-built containers are visually inspected daily by qualified personnel. The containers have minimal corrosion potential since the containers are either mounted such that they have no contact with the ground or are single-use containers. The container materials of construction are compatible with the oils stored so that internal corrosion poses a minimal risk of failure. Containers are located near drainage to the refinery sewer system, and/or are situated atop portable secondary containment for the container capacity. In the event of a spill, a land-based spill response kit prevents any discharge of oil in quantities that may be harmful from reaching any navigable water or adjoining shoreline. Spill response equipment, supplies, and personnel are maintained onsite.

8.5.3 Overfill Prevention for Mobile/Portable Containers [40 C.F.R. §112.8(c)(8)]

Pursuant to 40 C.F.R. §112.8(c)(8), each container installation is to be engineered or updated in accordance with good engineering practice to avoid discharges. At least one of the following devices must be provided:

- (i) High liquid level alarms with an audible or visual signal at a constantly attended operation or surveillance station. In smaller facilities an audible air vent may suffice.
- (ii) High liquid level pump cutoff devices set to stop flow at a predetermined container content level.
- (iii) Direct audible or code signal communication between the container gauger and the pumping station.
- (iv) A fast response system for determining the liquid level of each bulk storage container such as digital computers, telepulse, or direct vision gauges. If you use this alternative, a person must be present to monitor gauges and the overall filling of bulk storage containers.
- (v) Liquid level sensing devices shall be regularly tested to ensure proper operation.

Mobile/portable containers do not have an overfill prevention system as a matter of good engineering practice.

WRC achieves equivalent environmental protection in the following alternate manner. Where applicable, mobile/portable containers have an overfill protection procedure considered to be equivalent environmental protection and is described as follows. Mobile/portable containers arrive (1) pre-filled from a vendor; (2) are constantly attended and observed during filling operations; and (3) have secondary containment, as described in Section 8.5.2 and/or spill response protection.

8.5.4 Aboveground Piping Warning [40 C.F.R. §112.8(d)(5)]

Pursuant to 40 C.F.R. §112.8(d)(5), all vehicles entering the facility shall be warned to be sure that no vehicle will endanger aboveground piping or other oil transfer operations.

67 FR 47126 dated July 17, 2002, states that no particular height restriction is incorporated into the rule. Rather, aboveground piping at any height must be protected from vehicular traffic unless the piping is so high that all vehicular traffic passes underneath the piping.

Where applicable, the following aboveground piping precautions are considered equivalent environmental protection. The vast majority of aboveground oil piping is located either within diked areas with limited access and/or located high enough such that all vehicular traffic passes beneath the piping. This limits the danger to aboveground piping from vehicles. In addition and where appropriate, clearance elevations are displayed on aboveground pipe racks which may be susceptible to vehicular traffic. Only emergency, maintenance, and other authorized vehicles have access to the processing areas. A safety permitting system is used for vehicle and equipment access to processing areas to avoid risks associated with aboveground piping.

8.6 Facility Oil Storage Diagram [40 C.F.R. §112.7(a)(3)]

Figures 11 and 12 (Appendix E) show Material Storage Areas (MSAs) for the aboveground bulk storage containers and Portable Material Storage Areas (PMSAs) for the mobile/portable storage containers. Figures 13 through 17 (Appendix E) show storage locations for oil-filled electrical equipment. Figures 18 and 19 (Appendix E) show storage locations for oil-filled operating equipment and oil-filled manufacturing equipment, respectively. Figure 20 (Appendix E) show the transfer area loading/unloading operations map. Figure 3 (Appendix A) and Figure 21 (Appendix E) show the piping maps. Figures 22 and 23 of Appendix E show base flood elevations for West Sandy Creek and the unnamed tributary to Turkey Sandy Creek, respectively.

8.6.1 Storage Container Contents and Capacities [40 C.F.R. §112.7(a)(3)(i)]

Exempt oil storage containers are shown in Table 5 of Appendix F. MSAs for aboveground tanks are shown in Table 6 of Appendix F. PMSAs for mobile/portable storage containers are shown in Table 7 of Appendix F.

8.7 Discharge Prevention Measures [40 C.F.R. §112.7(a)(3)(ii)]

WRC has provided adequate discharge prevention measures through the implementation of this Plan. The following sections describe discharge prevention measures for the routine handling of oil (including loading, unloading, and facility transfer operations) taken to implement the Plan. Implementation generally includes training of employees and supervisors handling oil in the topics covered by this Plan; routine inspections and testing to prevent and discover discharges; application of security measures to deter vandalism that might result in a discharge; and operating engineering controls to prevent discharges from bulk storage containers, mobile/portable containers, oil-filled operational equipment, and transfer areas.

8.8 Discharge or Drainage Controls [40 C.F.R. §112.7(a)(3)(iii)]

8.8.1 Bulk Storage Containers

Aboveground bulk storage tanks containing oil are provided with a primary containment system consisting of a steel single wall constructed in accordance with either STI or API standards and compatible with the material stored and the conditions of storage, i.e., pressure and temperature. Specific secondary containment systems are described in Table 6 of Appendix F and satisfy the general secondary requirements of 40 C.F.R. §112.7(a)(3)(iii). Certain secondary containment dikes have been identified as requiring repair or modification to provide sufficient containment for the entire capacity of the largest tank plus freeboard for precipitation based on a 25-year, 24-hour rainfall event. Calculated capacities of specific secondary containment systems are presented in Table 22 (Appendix L). WRC has begun implementation of the necessary corrective work.

8.8.2 Mobile/Portable Containers

Mobile/portable containers are provided with a primary containment system consisting of materials which are compatible with the material stored and the conditions of storage, i.e., pressure and temperature. Mobile/portable containers are provided with general secondary containment systems as described in Table 7 of Appendix F.

8.8.3 Oil-Filled Electrical Equipment

Oil-filled electrical equipment having an oil storage capacity greater than or equal to 55 gallons are provided with a primary containment system consisting of materials which are compatible with the material stored and the conditions of storage, i.e., pressure and temperature. Oil-filled electrical equipment is provided with general secondary containment systems as described in Table 8 of Appendix F.

8.8.4 Oil-Filled Operating Equipment

Oil-filled operating equipment having an oil storage capacity greater than or equal to 55 gallons are provided with a primary containment system consisting of materials which are compatible with the material stored and the conditions of storage, i.e., pressure and temperature. Oil-filled operating equipment is provided with general secondary containment systems as described in Table 9 of Appendix F.

8.8.5 Oil-Filled Manufacturing Equipment

Oil-filled manufacturing equipment is provided with a primary containment system consisting of materials which are compatible with the material processed and the conditions of operation, i.e., pressure and temperature. Oil-filled manufacturing equipment is provided with general secondary containment systems as described in Table 10 of Appendix F.

8.8.6 Transfer Areas, Equipment and Activities

8.8.6.1 Loading and Unloading Areas/Racks

Loading and unloading areas/racks are provided with secondary containment systems as described in Table 11 of Appendix F. Piping is provided with a secondary containment system as described in Table 12 of Appendix F.

8.8.6.2 Bulk Chemicals Unloading Areas

Bulk chemicals are unloaded directly into storage containers at the process units, or delivered in portable containers to the warehouse dock. Chemicals in portable containers are hauled to a fenced tote storage area located on the west side of the building, or directly to process areas in the refinery. No reportable spills from the bulk chemicals unloading area have occurred in the past 12 months.

In the event of a spill, bulk chemicals unloading areas are provided with a secondary containment system consisting of curbing and/or the refinery sewer collection system, and/or a land-based spill response kit which is used to prevent any discharge of oil in quantities that may be harmful to any navigable water or adjoining shoreline. Totes in process areas are placed on containment units designed to contain the entire tote contents, and/or discharge to the refinery sewer system. Drainage from the warehouse tote storage area flows to a catchment basin which is pumped to the refinery sewer system.

8.8.6.3 Equipment

In the transfer areas, fill ports for all ASTs are equipped with drip pans to contain small leaks from the piping/hose connections. In addition, all fill ports are secured within a fenced area, enclosure, or fitted with a locking cap. Fill port caps are to be opened only when being filled and replaced when filling is complete.

8.8.6.4 Supplier Approval

All suppliers must meet the minimum requirements and regulations for tank truck unloading as established by the United States Department of Transportation.

WRC also ensures that all suppliers understand the site layout, know the protocols for entering the site and loading or unloading product, and have the necessary spill equipment on board to respond to a spill from the vehicle delivery hose.

8.8.6.5 Loading/Unloading Procedures

WRC and LACT/Crude tank truck and railcar product delivery procedures are described in Appendix I.

8.8.6.6 Draining Storm Water from Containment Areas and Sumps

Tank dikes, impoundments, piping/dispenser sumps are drained only under the direct supervision of facility personnel. Dike drainage occurs only via sumps and pumps operated by facility personnel.

- Dike drain valves are normally kept locked in a closed position except when draining the dike.
- Accumulated storm water is inspected for sheen, and only water without a visible sheen is released. Storm water is discharged via a discharge permit issued by the Oklahoma Department of Environmental Quality. Contaminated storm water is discharged to the refinery wastewater treatment plant, operated under a discharge permit issued by the Oklahoma Department of Environmental Quality.

8.9 Countermeasures for Discharge Discovery [40 C.F.R. §112.7(a)(3)(iv)]

WRC employs adequate countermeasures for discharge discovery, response, and cleanup through implementation of this Plan. In addition, WRC retains appropriate oil spill removal companies to ensure the availability of necessary personnel and equipment for discharge discovery, response and cleanup.

8.10 Methods of Disposal [40 C.F.R. §112.7(a)(3)(v)]

Any material spilled on-site is cleaned up in a manner that minimizes environmental impacts. Waste material generated by the clean-up process is handled in accordance with Federal and State waste disposal requirements. All waste is sent to commercial, off-site disposal facilities that are appropriately authorized to handle such waste.

8.11 Contact List [40 C.F.R. §112.7(a)(3)(vi)]

A list of emergency contacts is shown in Appendix O. This list includes facility contacts, spill response contractor contacts, discharge notification contacts, state and local emergency response contacts.

8.12 Discharge Notification Procedures and Form [40 C.F.R. §112.7(a)(4)]

Any size discharge (i.e., one that creates a sheen, emulsion, or sludge) that affects or threatens to affect navigable waters or adjoining shorelines must be reported immediately to the National Response Center (1-800-424-8802), SERC, and LEPC. Discharge Notification Procedures and a documentation form are shown in Appendix Q. Oil discharge records should be maintained in Appendix K.

8.14 Discharge Response [40 C.F.R. §112.7(a)(5)]

This section describes the cleanup response and protocols to follow in the event of an oil spill. Depending on the volume and characteristics of the material released, WRC has defined a spill response as either a "Minor Spill Response" or "Major Spill Response" ("Spill Emergency"). An inventory of available discharge response equipment maintained by WRC is provided in Appendix P.

8.14.1 Minor Spill Response [112.7(a)(3)(iv)]

A "Minor Spill Response" is defined as one that poses no significant harm to human health or the environment. These spills involve generally small quantities and can usually be cleaned up by WRC personnel. Other characteristics of a minor spill include the following:

- the spilled material is easily stopped or controlled at the time of the spill;
- the spill is localized;
- the spilled material is not likely to reach surface water or groundwater;
- there is little danger to human health, and there is little danger of fire or explosion.

In the event of a minor spill the following guidelines shall apply:

- Stop the source if the spill is ongoing.
- Contain the spill with spill response materials and equipment.
- Place spill debris in properly labeled waste containers.
- Prepare and submit an incident report.

8.14.2 Major Spill Response [112.7(a)(3)(iv)]

Characteristics of a "Major Spill Response" include the following:

- the spill is large enough to spread beyond the immediate spill area;
- the spilled material enters surface water;
- the spill requires special training and equipment for response;
- there is a danger of fire or explosion.

In the event of a spill emergency, the following guidelines shall apply:

- Stop the source if the spill is ongoing only if safe to do so.
- Activate the refinery emergency response plan.
- Perform external notifications as required (can use form in Appendix Q).
- Restore stable conditions.
- Implement cleanup activities.

8.14.3 Oil Spill Contingency Plan

WRC has prepared an Integrated Contingency Plan (ICP) for response to any refinery emergency, including oil spills. The ICP has been designed to fulfill the regulatory requirements of 40 C.F.R. Part 112.7(d) and 112.20 – 112.21. A copy of the ICP can be found at the main office during regular business hours.

8.15 Potential Discharge Volumes and Direction of Flow [40 C.F.R. §112.7(b)]

8.15.1 Bulk Material Storage Areas

Maximum potential release volumes, discharge rate, directions of spill flow and secondary containment for each bulk material storage area are shown in Table 13 of Appendix G.

8.15.2 Mobile/Portable Material Storage Areas

Maximum potential release volumes, discharge rate, directions of spill flow and secondary containment for each mobile/portable material storage area are shown in Table 14 of Appendix G.

8.15.3 Oil-Filled Operational Equipment Areas

Maximum potential release volumes, discharge rate, directions of spill flow and secondary containment for each oil-filled operational equipment area (i.e., electrical, operating, and manufacturing) are shown in Tables 15, 16 and 17 of Appendix G.

8.15.4 Loading and Unloading Areas/Racks

Maximum potential release volumes, discharge rate, directions of spill flow and secondary containment for each loading and unloading area/rack are shown in Table 18 of Appendix G.

8.15.5 Transfer Areas

Maximum potential release volumes, discharge rate, directions of spill flow and secondary containment for each piping area are shown in Table 19 of Appendix G.

8.16 Containment and Diversionary Structures [40 C.F.R. §112.7(c)]

Appropriate containment and/or diversionary structures or equipment has been provided to minimize the potential for discharges as described in §112.1(b). Certain secondary containment dikes have been identified as requiring repair or modification to provide sufficient containment for the entire capacity of the largest tank plus freeboard for precipitation based on a 25-year, 24-hour rainfall event. Calculated capacities of specific secondary containment systems are presented in Table 22 (Appendix L).

8.16.1 Dikes, Berms, or Retaining Walls Sufficiently Impervious to Contain Oil

Secondary containment systems consisting of berms or retaining walls sufficiently impervious (Table 20 of Appendix H) to contain the oil until the time at which cleanup occurs has been provided for aboveground bulk storage containers.

8.16.2 Curbing or Drip Pans

WRC utilizes drip pans in the fuel transfer areas, when hoses are uncoupled during bulk transfer operations, and for pumps, valves, and fittings to isolate and contain small drips or leaks until the source of the leak is repaired.

8.16.3 Sumps and Collection Systems

WRC utilizes sumps in the loading rack areas to collect spills and leaks. WRC also utilizes the refinery sewer system as a collection system to collect oil from the process areas of the refinery.

8.16.4 Culverting, Gutters, or other Drainage Systems

Culverting and/or gutters have been provided to direct spills to remote containment or treatment areas where appropriate.

8.16.5 Weirs, Booms, or Other Barriers

Storm water Outfall 002 is provided with an underflow dam to prevent oil escape and overflow weir filled with hay bales, should stormwater levels rise high enough. The hay bales can be used in combination with the weir to remove oil from the surface of the water.

Spill mats and storm drain covers are utilized to block or prevent the flow of oil to the refinery stormwater collection system.

8.16.6 Spill Diversion and Retention Ponds

WRC utilizes several storm water detention ponds around the refinery for collection of stormwater runoff, subsequently discharged under the facility's OPDES discharge permit.

8.16.7 Sorbent Materials

Sorbent materials, i.e., insoluble materials or mixtures of materials (such as booms, spill pads, pillows, socks, and mats) are used to isolate and contain small drips or leaks until the source of the leak is repaired. WRC also utilizes the sorbent materials as an active containment measure (or countermeasure) to contain and collect small-volume discharges before they reach any navigable water or adjoining shoreline.

8.17 Practicability of Secondary Containment [40 C.F.R. §112.7(d)]

WRC management has determined that the use of secondary containment structures or readily available equipment to prevent discharged oil from reaching navigable waters or adjoining shores is practicable and effective for all areas at the facility with the exception of intra-facility gathering lines as described below.

8.17.1 Intra-Facility Gathering Lines

The SPCC Guidance for Regional Inspectors August 28, 2013 states the following:

The term "gathering lines" refers to piping or pipelines that transfer crude oil product between tank batteries, within or between facilities. Gathering lines often originate from an oil production facility's lease automatic custody transfer (LACT) unit, which transfers oil to other facilities involved in gathering, refining or pipeline transportation operations. EPA considers gathering lines subject to EPA's jurisdiction if they are located within the boundaries of an otherwise regulated SPCC facility (that is, intra-facility gathering lines) (73 FR 74274, December 5, 2008). Intra-facility gathering lines subject to DOT requirements at 49 CFR parts 192 or 195 are exempt from the SPCC rule entirely.

Intra-facility gathering lines, associated valves and equipment are provided with a primary containment system consisting of materials which are compatible with the materials processed and the conditions of operation, i.e., pressure and temperature.

In lieu of secondary containment WRC has an Integrated Contingency Plan which includes provisions for oil spills, including a written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful.

WRC has also implemented an intra-facility gathering line maintenance program which consists of visually inspecting and/or testing intra-facility gathering lines and associated appurtenance on a periodic and regular schedule for leaks, oil discharges, corrosion, or other conditions that could lead to a discharge. Repairs required by any regularly scheduled visual inspection, test, or evidence of a discharge are promptly made. In addition, actions required to stabilize and to remediate any accumulations of oil discharges associated with intra-facility gathering lines and associated appurtenances are promptly made.

8.18 Inspections, Tests, and Records [40 C.F.R. §112.7(e)]

WRC routinely performs inspections for malfunctions, deterioration, operator errors, leaks, damage, discharge, or corrosion of SPCC-regulated valves, pumps, tanks, piping, oil handling storage and handling equipment, and spill prevention equipment, to minimize the possibility of oil spills.

A list of equipment and areas where detailed inspections may be necessary, along with recommended inspection schedules, is given in Table 23 of Appendix M. Inspections conducted to satisfy the requirements of other environmental programs or routine maintenance activities may suffice for the inspection requirements of this Plan provided such inspections cover the requirements listed and the elements identified in the inspection form provided in Appendix M.

WRC safety and operations personnel are on duty 24 hours per day, 7 days per week. Inspection rounds of the facility, which include visual observation of oil storage containers and equipment, are made a minimum of twice daily. Facility security inspections are performed multiple times daily.

Monthly container inspections are performed by WRC personnel using the checklist in Table 24 of Appendix M. Issues regarding oil storage containers or piping are reported to the operations supervisor, with work orders written for corrective action.

Oil analyses of oil-filled electrical transformers are performed by contract personnel.

8.18.1 Periodic Integrity Testing

Periodic visual and formal integrity testing of aboveground bulk storage tanks are performed by qualified personnel in accordance with the requirements in API 653.

Aboveground storage tank inspection and integrity test requirements, based on tank fabrication type and size, are shown in Table 21 of Appendix J.

8.18.2 Inspection Records

Inspections will be documented and signed or initialed by appropriately trained personnel. Inspections records will be maintained for a minimum of 3 years. Integrity inspection records are maintained in the refinery Inspection Department.

8.19 Personnel, Training, and Discharge Prevention Procedures [40 C.F.R. §112.7(f)]

8.19.1 Personnel Training [40 C.F.R. §112.7(f)(1)]

Oil handling employees are trained in general facility operations and the operation and maintenance of equipment to prevent discharges as part of their normal job training. Discharge prevention procedure protocols are included with employee emergency response plan training. A SPCC Personnel Training Program Outline is provided in Appendix N. Records of employee training are maintained by the refinery Training Department.

8.19.2 Designated Person Accountable for Discharge Prevention [40 C.F.R. §112.7(f)(2)]

The Refinery Manager is the designated person accountable for oil discharge prevention.

8.19.3 Discharge Prevention Briefings [40 C.F.R. §112.7(f)(3)]

Oil-handling personnel take part in discharge prevention briefings at least once per year. Topics include discharge procedure protocols, known discharges, failures, malfunctioning components, facility emergency response plan training, and applicable pollution control laws.

8.20 Security (Excluding Oil Production Facilities) [40 C.F.R. §112.7(g)]

8.20.1 Fencing [40 C.F.R. §112.7(g)]

The facility is fenced, gated, and periodically patrolled. The facility has entrance gates that are locked and /or guarded 24 hours a day. Speed limits are posted to minimize potential vehicle accidents within the facility. Security cards are used to control facility access.

8.20.2 Valves

Valves that control the flow of oil have adequate security measures so that they remain in the closed position when in non-operating or non-standby status. The fencing, access control, and periodic security patrols (Section 8.20.1) provide such security.

8.20.3 Pump Starter Controls

Starter controls on pumps in non-operating or standby status are located at a site accessible only by authorized personnel. The fencing, access control, and periodic security patrols (Section 8.20.1) provide such security.

8.20.4 Loading/Unloading Piping Connections

Piping connections are capped when not in service or when in standby service for an extended time.

8.20.5 Lighting

Outdoor lighting is sufficient to assist in the discovery of spills or discharges from containers during hours of darkness and the prevention of discharges occurring through acts of vandalism.

8.21 Facility Tank Car and Tank Truck Loading/Unloading Rack (Excluding Offshore Facilities) [40 C.F.R. §112.7(h)]

Figure 20 of Appendix E shows the locations of the loading and unloading areas (LUA) and loading and unloading racks (LUR) and directions of spill flow. Table 11 of Appendix G shows the potential volume released, discharge rate, direction of flow, and secondary containment for each unloading and unloading area/rack.

8.21.1 Catchment Basin [40 C.F.R. §112.7(h)(1)]

Where loading/unloading rack drainage does not flow into a catchment basin or treatment facility designed to handle discharges, a quick drainage system for tank car or tank truck loading/unloading racks should be used. Containment systems should be designed to hold at least the maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded at the facility.

WRC utilizes a loading/unloading rack drainage system as described in Table 11 of Appendix F.

8.21.2 Interlock Warning [40 C.F.R. §112.7(h)(2)]

WRC utilizes an interlock warning light or physical barrier system, warning signs, wheel chocks or vehicle brake system in the area adjacent to a loading/unloading rack, to prevent vehicles from departing before complete disconnection of flexible or fixed oil transfer lines.

8.21.3 Inspected Prior to Filling/Departure [40 C.F.R. §112.7(h)(3)]

Prior to filling and departure of any tank car or tank truck, appropriate personnel shall closely inspect for discharges the lowermost drain and all outlets of such vehicles, and if necessary, ensure that they are tightened, adjusted, or replaced to prevent liquid discharge while in transit.

8.22 Brittle Fracture Evaluation [40 C.F.R. §112.7(i)]

In the event that any field-erected tank undergoes a repair, alteration, reconstruction, or change in service that might affect the risk of a discharge or failure, this tank should be evaluated for risk of discharge or failure, following API-653 or an equivalent approach, and corrective actions shall be taken as necessary.

8.23 Conformance with State and Local Applicable Requirements [40 C.F.R. §112.7(j)]

The State of Oklahoma does not have regulations in place that specifically supersede federal SPCC requirements set forth in 40 C.F.R. Part 112.

WRC holds Oklahoma Pollutant Discharge Elimination System (OPDES) Permit OK0000825 from the Oklahoma Department of Environmental Quality (ODEQ) which authorizes the discharge of treated process wastewater via Outfall 001 to the Washita River and treated storm water runoff via Outfall 002 to an unnamed tributary of Turkey Sandy Creek. A copy of OPDES Permit OK000825 is maintained on-site.

WRC holds RCRA Operations and Post-Closure Permit 000396549 from the ODEQ Land Protection Division for the operation of hazardous waste storage tank (Tank 2007) and for post closure monitoring of a Solid Waste Management Unit (SWMU) located just south of the API separator. A copy of the RCRA Operations and Post-Closure Permit 000396549 is maintained on-site.

WRC complies with the Emergency Planning and Community Right-to-Know Act (EPCRA), also known as Superfund Amendments and Reauthorization Act (SARA) Title III regarding emergency planning and preparedness at both the state and local levels. The State Emergency Response Commission (SERC) is responsible for overseeing EPCRA requirements in the State of Oklahoma. The Local Emergency Planning Committee (LEPC) works to understand chemical hazards in the community, develop emergency plans in case of an accidental release, and look for ways to prevent chemical accidents.

8.24 Qualified Oil-Filled Operational Equipment [40 C.F.R. §112.7(k)]

WRC utilizes oil-filled operational equipment and meets the qualifying criteria for this portion of the regulation in that it has "had no single discharge as described in §112.1(b) from any oil-filled operational equipment exceeding 1,000 U.S. gallons or no two discharges as described in §112.1(b) from any oil-filled equipment each exceeding 42 U.S. gallons within any twelve month period in the three years prior to the Plan certification date."

WRC has, however, chosen not to implement the alternate secondary containment requirements described in 40 C.F. R. §112.7(k).

9.0 SPCC Provisions for Onshore Facilities (Excluding Production Facilities)

9.1 Facility Drainage [40 C.F.R. §112.8(b)]

9.1.1 Diked Storage Area Drainage [40 C.F.R. §112.8(b)(1)]

Some tank dikes (on east side of US Highway 77) can discharge to the refinery's OPDES permitted stormwater outfall 002. (If not, these dikes are discharged to outfall 001 from the wastewater treatment plant.) Storm water collected inside these secondary containment areas is restrained with a valve that remains in the closed position when not in use. Discharge from secondary containment to storm water drainage is only allowed when collected water is visually inspected and found not to be impacted by oil. Many tank dikes discharge only to the refinery wastewater treatment system, which includes oil recovery and discharges via permitted outfall 001.

9.1.1.1 Valves for the Drainage of Diked Storage Areas [40 C.F.R. §112.8(b)(2)]

Drainage from diked storage areas and secondary containment at the facility is restrained by valves of manually open/closed design (not flapper-type drain valves). If drainage is released to a watercourse and not into an on-site wastewater treatment plant, the retained storm water is inspected prior to discharge to ensure that no pollutants are discharged in quantities that may be harmful to any navigable water or adjoining shoreline.

9.1.2 Un-diked Storage Area Drainage [40 C.F.R. §112.8(b)(3)]

Drainage systems from un-diked areas with a potential for a discharge (such as where piping is located outside containment walls or where tank truck discharge may occur outside the loading area) should be designed to flow into ponds, lagoons, or catchment basins designed to retain oil or return it to the facility. Catchment basins shall not be located in areas subject to periodic flooding.

Surface drainage from un-diked storage areas in the western section of the refinery is directed to either permitted surface impoundment F04 or F05. F04 is equipped with pumps that can transfer water to the wastewater treatment system which discharges via Outfall 001 to the Washita River. F05 is a total retention surface impoundment.

Surface drainage in the central section of the refinery is directed to either the refinery sewer system then to the wastewater treatment system prior to being discharged via Outfall 001 to the Washita River, or to the storm water conveyance channel through an underflow dam with a hay bale-stuffed overflow weir/screen prior to being discharged via Outfall 002 to the unnamed tributary to Turkey Sandy Creek. In this section of the refinery, WRC also utilizes a combination of BMPs including a vegetative filter strip and land-based spill response equipment to prevent the discharge of oil in quantities that may be harmful to any navigable water or adjoining shoreline.

No surface drainage occurs from un-diked areas in the eastern and southern sections of the refinery. Storm water runoff is directed to the south and west. Storm water from the eastern section eventually discharges via Outfall 002. In these sections of the refinery, WRC utilizes a combination of BMPs including a vegetative filter strip and land-based spill response equipment to prevent any discharge of oil in quantities that may be harmful to any navigable water or adjoining shoreline.

9.2 Diversion System [40 C.F.R. §112.8(b)(4)]

If facility drainage is not engineered as in (Section 9.1.2), the final discharge of all ditches inside the facility shall be equipped with a diversion system that would, in the event of an uncontrolled discharge, retain oil in the facility.

Facility drainage in the western and central sections of the refinery is engineered as described in Section 9.1.2. Drainage in the eastern and southern sections of the refinery is contained as necessary and conveyed to the wastewater treatment system. Non-process areas at the eastern section of the refinery drain to OPDES-permitted stormwater outfall 002. WRC can utilize a combination of BMPs in the eastern and southern sections of the refinery including a combination of vegetative filter strips and land-based spill equipment to prevent the discharge of oil in harmful quantities to any navigable water or adjoining shoreline.

9.3 Equipment Failure or Human Error [40 C.F.R. §112.8(b)(5)]

Where drainage waters are treated in more than one treatment unit and such treatment is continuous, and pump transfer is needed, two "lift" pumps shall be provided and at least one of the pumps shall be permanently installed. Whatever techniques used, engineer facility drainage systems to prevent a discharge as described in §112.1(b) in case there is an equipment failure or human error at the facility.

Surface drainage waters in the western section of the refinery are retained in surface impoundment F04 or F05 and pumped, on an as able basis, to the refinery wastewater treatment system. Surface drainage waters in the central section of the refinery are directed to the wastewater treatment system on a continuous basis without the need of any pump. Surface drainage waters in the eastern and southern sections of the refinery do not require the use of dedicated pumps. As a result, equipment failure or human error will not facilitate the discharge of un-diked surface waters.

9.4 Bulk Storage Containers [40 C.F.R. §112.8(c)), (c)(1) and (c)(2)]

Aboveground bulk storage tanks containing oil are provided with primary and secondary containment systems as described in Table 6 of Appendix F. WRC's tank dike design is being updated to provide containment for the entire capacity of the largest tank, plus freeboard for precipitation based on the 25-year, 24-hour rainfall event, consistent with the wastewater treatment system design. That rainfall event is 7.1". Dike capacities are summarized in Table 22 of Appendix L. An implementation schedule for dike updates is presented in Table 22A.

9.5 Drainage of Diked Areas [40 C.F.R. §112.8(c)(3)]

Dikes are drained under direct facility supervision. The accumulated water is observed for signs of oil prior to draining. The gate valves are normally kept in a closed position and locked except when draining the dike.

9.6 Corrosion Protection [40 C.F.R. §112.8(c)(4)]

This section is not applicable since no underground storage tanks are present at the facility.

9.7 Partially Buried and Bunkered Storage Tanks [40 C.F.R. §112.8(c)(5)]

This section is not applicable since no partially buried or bunkered storage tanks are present at the facility.

9.8 Aboveground Container Integrity Testing [40 C.F.R. §112.8(c)(6)]

9.8.1 Aboveground Storage Tanks

WRC utilizes aboveground storage tanks (and associated piping) which are subject to the periodic integrity testing of 40 C.F.R. §112.8(c)(6).

Integrity testing is done in accordance API 653 and/or Steel Tank Institute (STI) Standard for the Inspection of Aboveground Storage Tanks, SP001 (latest version). Table 21 of Appendix J shows the classification of bulk storage containers and the corresponding integrity testing requirements.

If non-destructive integrity testing is performed on one of the regulated bulk storage containers at the facility, a record of the test is maintained in the refinery Inspection Department. If visual inspections conducted pursuant to Section 8.18 of this Plan identify the likelihood of a tank failure, the facility shall have the subject tank physically tested in accordance with API 653 requirements.

9.8.2 Mobile/Portable Containers

All mobile/portable containers used to store oil at the facility are United States Department of Transportation (US DOT) approved.

WRC achieves equivalent environmental protection for integrity testing as stated in Section 8.5.2 of this Plan.

9.9 Heating Coils [40 C.F.R. §112.8(c)(7)]

Internal heating coils, used on asphalt and heavy oil storage tanks, do not discharge into any navigable waterway and/or adjoining shoreline. Steam return and exhaust lines are monitored for signs of leakage as routine operator inspections.

9.10 Overfill Protection Systems [40 C.F.R. §112.8(c)(8)]

9.10.1 Aboveground Storage Tanks (ASTs)

All ASTs are equipped with direct-read liquid level gauges which are visible to personnel. In addition, all fixed ASTs are equipped with high level alarms set at 90 percent of the rated capacity.

All overfill prevention systems are checked on a monthly basis during the monthly inspection of the facility, following the manufacturer recommendations.

9.10.2 Mobile/Portable Containers

Mobile/portable containers are refilled in accordance with the procedure described in Section 8.5.3 of this Plan.

9.10.3 Oil-Filled Electrical and Operational Equipment

Oil-filled electrical and operational equipment are refilled in accordance with the procedure described in Section 8.5.3 of this Plan.

9.10.4 Oil-Filled Manufacturing Equipment

Process operations are controlled from a control room with pressure, temperature and flow safety devices including audio and visual alarms and automatic shut downs. Safety devices are tested regularly to ensure proper operation.

9.11 Effluent Treatment Facilities [40 C.F.R. §112.8(c)(9)]

WRC holds OPDES Permit OK000825 which authorizes the discharge of process wastewater and storm water via Outfalls 001 and 002, respectively. Process wastewater and storm water effluent discharges are monitored and records maintained according to the requirements of OPDES permit OK000825.

9.12 Visible Discharges [40 C.F.R. §112.8(c)(10)]

Visible discharges from any container or appurtenance (seams, gaskets, piping, pumps, valves, rivets, and bolts) are quickly corrected upon discovery.

Oil is promptly removed from any dike and disposed via oil recovery back into the refinery process units and/or the refinery wastewater treatment system.

9.13 Mobile and Portable Containers [40 C.F.R. §112.8(c)(11)]

Small portable oil storage containers, such as 55-gallon drums, are stored at locations where drainage and/or washdown to the refinery sewer system can occur. For drums inside the maintenance shop, secondary containment is provided by floor and building walls. Any discharged material is quickly contained and cleaned up using sorbent pads and appropriate cleaning products.

9.14 Transfer Operations, Pumping, and In-Plant Processes [40 C.F.R. §112.8(d)]

Transfer operations equipment include piping, valves, gauges, regulators, compressors, pumps and other mechanical devices used to transfer oil from one place to another within the facility. Pipelines used to transport oil exclusively within the confines of a non-transportation-related facility are regulated under the SPCC program. Pipelines used to transport oil for interstate or intrastate commerce are transportation-related systems and regulated by the Department of Transportation's (DOT) Office of Pipeline Safety (OPS) program.

9.14.1 Buried Piping [40 C.F.R. §112.8(d)(1)]

Most buried oil piping was installed prior to August 16, 2002. Any buried piping installed after August 16, 2002 utilizes protective wrapping and coating to satisfy the cathodic protection standards for piping. When a section of buried line is exposed, it will be visually inspected for deterioration. If corrosion damage is discovered, further inspection will be performed and corrective action taken, if deemed appropriate. Plastic or fiberglass-reinforced pipes do not need protective coating or cathodic protection.

9.14.2 Piping Connections [40 C.F.R. §112.8(d)(2)]

Piping connections to the bulk storage tanks or loading racks are capped or blind-flanged and marked to origin when the pipeline is not in service. Lines that are not in service or are on standby for an extended period of time are capped or blank-flanged and marked as to their origin.

9.14.3 Pipe Supports [40 C.F.R. §112.8(d)(3)]

Piping supports have been designed to prevent structural failure of pipelines by minimizing abrasion and corrosion and allow for expansion and contraction.

9.14.4 Aboveground Valves, Piping, and Appurtenances [40 C.F.R. §112.8(d)(4)]

Aboveground piping, valves, and appurtenances associated with each piece of equipment are visually inspected often, as part of daily operator rounds. Appurtenances can include, as appropriate, such equipment as flange joints, expansion joints, valve glands and bodies, catch pans, pipe supports, locking of valves, and metal surfaces. Any component found to be in a poor condition or leaking will be replaced as soon as practicable.

Integrity and leak testing of buried piping is conducted at the time of installation, modification, or replacement.

9.14.5 Protection of Aboveground Piping and Other Transfer Operations from Vehicular Traffic [40 C.F.R. §112.8(d)(5)]

Pursuant to 40 C.F.R. **§**112.8(d)(5), vehicles entering a facility must be warned to be sure that no vehicle will endanger aboveground piping or other oil transfer operations. However, Federal Register 67, No. 137/Wednesday, July 17, 2002/Rules and Regulations page 47126 states,

"No particular height restriction is incorporated into the rule. Rather, aboveground piping at any height must be protected from vehicular traffic unless the piping is so high that all vehicular traffic passes underneath the piping."

The vast majority of aboveground oil piping is located within diked areas with limited access and/or located very high such that all vehicular traffic passes underneath the piping. This limits the danger to above ground piping from vehicles and is considered to be equivalent environmental protection.

10.0 Facility Response Plan [40 C.F.R. §112.20]

10.1 Facility Response Plan Applicability [40 C.F.R. §112.20(f)(1)]

WRC has an Integrated Contingency Plan which includes a written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful to any navigable water or adjoining shoreline. The plan is applicable to all types of refinery emergencies and has been designed to fulfill the regulatory requirements of 40 C.F.R. Part 112.7(d) and 112.20 – 112.21. A copy of the Integrated Contingency Plan can be found at the main office.

11.0 References / Bibliography

Statutes

1. 33 U.S.C. §1251 *et seq.*; Federal Water Pollution Control Act. Online at: http://www.law.cornell.edu/uscode/text33
2. 33 U.S.C. §2701 to 2761. Oil Pollution Act of 1990. Online at: http://www.gpo/fdsys/pkg/USCODE-2010-title33/html/USCODE-2010-title33-chap40.htm

Regulations

3. 40 C.F.R. 112. Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities, Final Rule, U.S. Environmental Protection Agency, 67 Federal Register 137 (July 17, 2002). Online at http://www.gpoaccess.gov/ecfr
4. OAC 165:26. Rules for Aboveground Storage Tanks, May 15, 2013. Oklahoma Corporation Commission. Online at: http://www.occ.state.ok.us
5. Title 265, Chapter 25. Oklahoma State Fire Marshal. Rules and Regulations for Combustible Liquids. Online at: http://www.ok.gov/fire/

Codes

6. NFPA 30, "Flammable and Combustible Liquids Code", 2003 Edition. National Fire Protection Association. Online at: http://www.nfpa.org/
7. NFPA 30A, "Code for Motor Fuel Dispensing and Repair Garages", 2003 Edition. National Fire Protection Association. Online at: http://www.nfpa.org/

Standards

8. Steel Tanks Institute, "Standard for Inspection of Aboveground Storage Tanks – SP001", 3rd Ed., July 2005. Online at: http://www.steeltank.com/
9. American Petroleum Institute, API Standard 653, "Tank Inspection, Repair, Alteration, and Reconstruction", Third Edition, Addendum 1, September 2003. Online at: http://www.api.org

General

10. U.S. Environmental Protection Agency, "SPCC Guidance for Regional Inspectors", Version 1.0, December 16, 2013. Online at: http://www.epa.gov/oilspill/pdfs/guidance/SPCC_Guidance_fulltext.pdf

Appendix A

Wynnewood Refining Company, LLC Figures

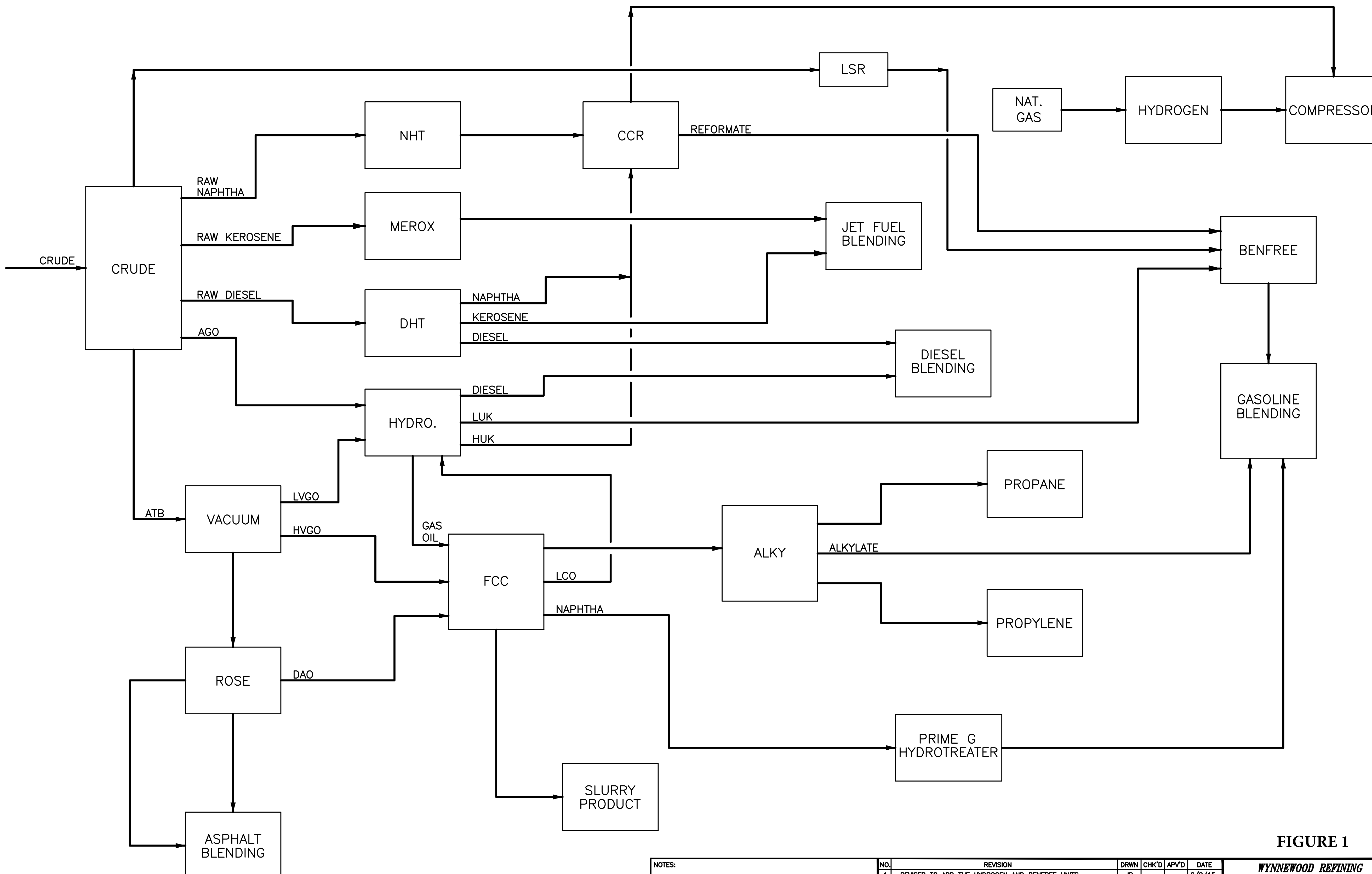


FIGURE 1

NOTES:

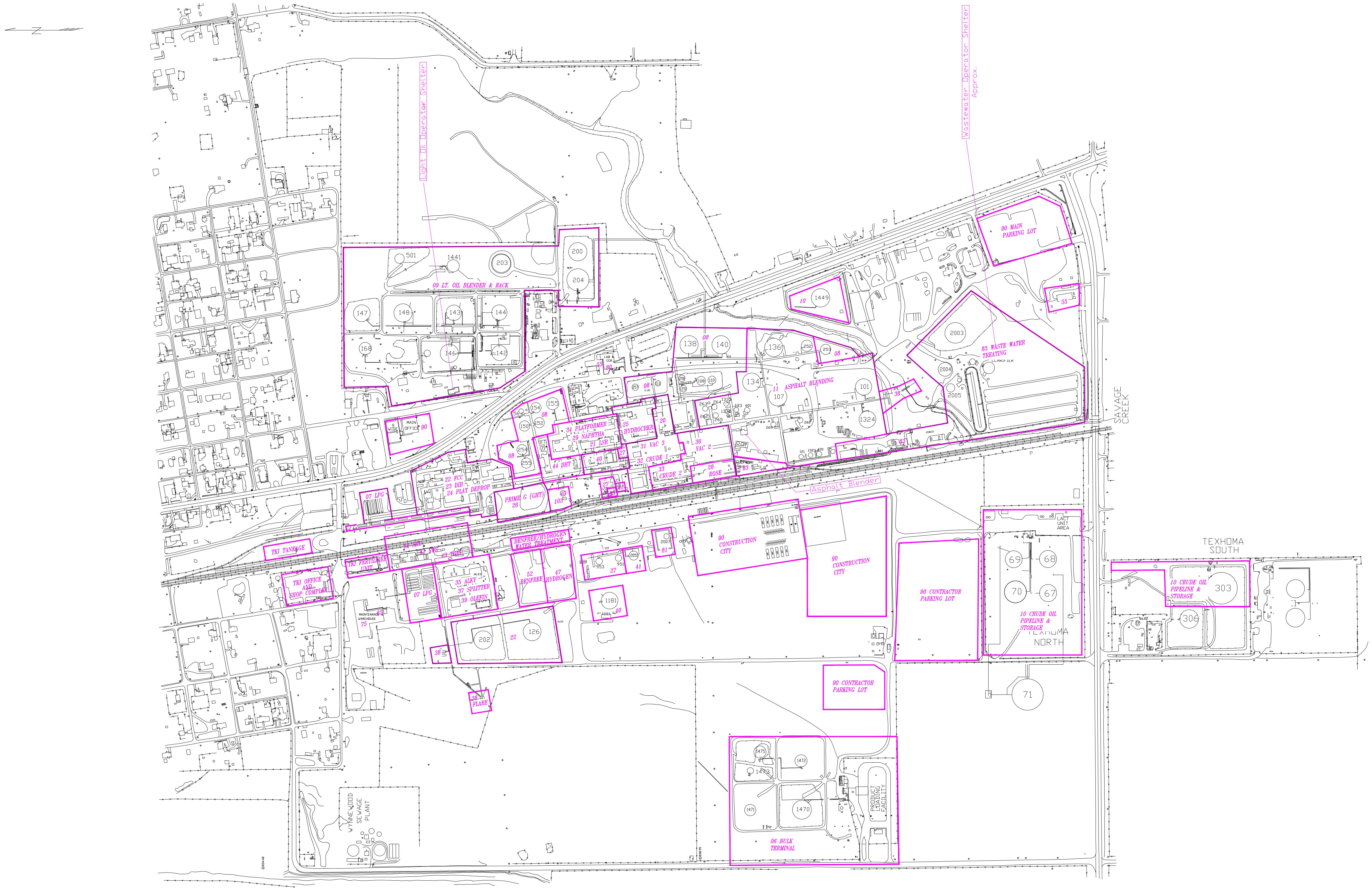
THIS IS NOT A CONTROLLED DOCUMENT

NO.	REVISION	DRWN	CHK'D	APV'D	DATE
1	REVISED TO ADD THE HYDROGEN AND BENFREE UNITS	JD			6/2/15

WYNNEWOOD REFINING
A CVR Refining LP, Company

WYNNEWOOD REFINING
BLOCK FLOW DIAGRAM

DRAWING NO. 85-F-008 REV. 1



ZONE & UNIT DESIGNATIONS

ZONE 1
- 3732 #1 CRUDE UNIT
- 3731 #3 VACUUM
- 3733 #2 CRUDE UNIT
- 3730 #2 VACUUM
- 3720 MEROX
- 3728 ROSE UNIT
- 3727 FUEL GAS TREATER (RFG)

ZONE 2
- 3722 FCCU
- 3723 DEISOBUTANIZER (DIB)
- 3724 PLAT DEPROPANIZER
- 3707 LPG AREA
- 3735 ALKY UNIT
- 3738 FLARE/STORM WATER
- 3737 SPLITTER
- 3739 OLEFIN
- 3741 SOUR WATER STRIPPER
- 3742 SULFUR RECOVERY UNIT

- 3726 GASOLINE HYDROTREATER

ZONE 3
- 3744 DISTILLATE HYDROTREATER
- 3725 HYDROCRACKER UNIT
- 3740 STEAM PROD. & UTILITY DIST.
- 3734 PLATFORMER
- 3721 LSR HYDROTREATER
- 3729 NAPHTHA HYDROTREATER

ZONE 4
- 3710 CRUDE OIL, PIPELINE & STORAGE
- 3711 ASPHALT BLENDING, OXIDIZER
- 3708 LT. OIL, SOLVENT & TANK CAR
- 3709 LT. OIL BLENDER & RACK
- 3706 BULK TERMINAL
- 3783 WASTE WATER TREATING

ZONE 5
- 3755 SAFETY SECURITY
- 3765 WAREHOUSE
- 3775 MAINTENANCE GENERAL
- 3780 LAB TECHNICAL SERVICES
- 3781 GENERAL ENVIRONMENTAL
- 3782 AIR ENVIRONMENTAL
- 3784 SOLID WASTE ENVIRONMENTAL
- 3785 OPERATIONS/GENERAL
- 3786 RELIABILITY & PROJECTS
- 3790 BUILDINGS/GROUNDS

FIGURE 2

CAD# PROTO15D(36X24)

NO.	DATE	REVISION	BY	CKD	APVD	APVD
5	11/10/14	REVISED ADDED TANKS 71 & 204	WA	DEM		
4	3/5/14	REVISED TO UPDATE PLOT PLAN	JD			
3	2/18/14	REV'D PER MOC2_2013_3 & 2_2013_20	JD			
2	6/7/13	ADD CONSTRUCTION CITY	JPD			
1	5/20/10	ADD NEW UNIT NUMBERS	DS			
0	1/6/10	DRAWN PER	TLH			

DRAWING NO.	DESCRIPTION

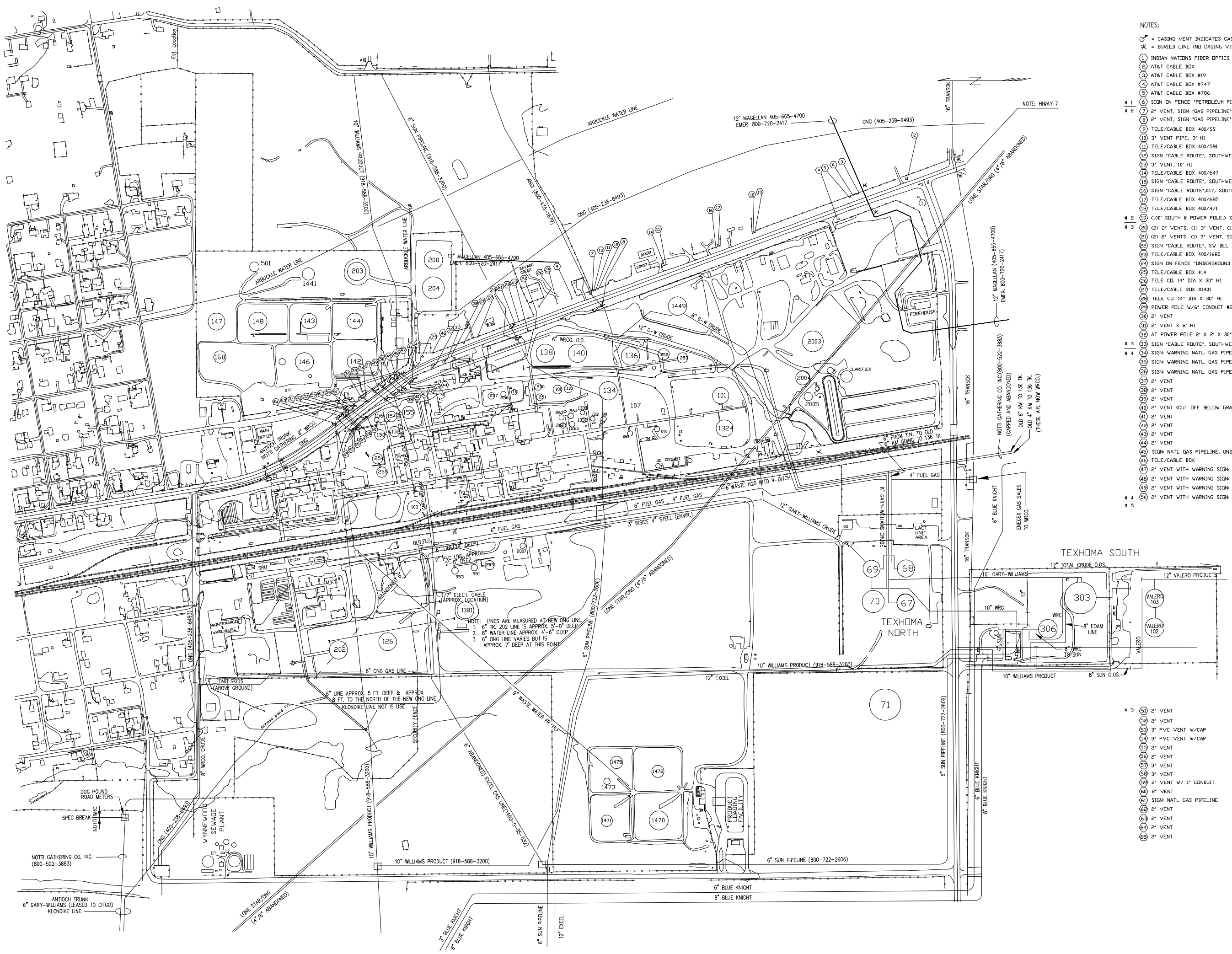
REFERENCED DRAWINGS

CHARGE:
B.O.M. NO.:
DATE: 2/26/14
SCALE: 1"=300'-0"
DRAWN: J. DIGBY
CHECKED:
APPROVED:
APPROVED:
APPROVED:
APPROVED:

WYNNEWOOD REFINING COMPANY
A Gary-Williams Energy Corporation Subsidiary

WYNNEWOOD REFINERY
PLOT PLAN
COST CENTERS

DRAWING NUMBER	REV.
90-G-002	5



NOTES:

= CASING VENT INDICATES CASING BELOW ROADWAY
= BURIED LINE (NO CASING VISABLE)

1 INDIAN NATIONS FIBER OPTICS
2 AT&T CABLE BOX
3 AT&T CABLE BOX #19
4 AT&T CABLE BOX #747
5 AT&T CABLE BOX #786
#1 6 SIGN ON FENCE "PETROLEUM PIPELINE KERR MAGEE"
#2 7 2" VENT, SIGN "GAS PIPELINE", 1 1/2" CONDUIT, DUKE ENERGY, 800-435-1679
8 2" VENT, SIGN "GAS PIPELINE", DUKE ENERGY, 800-435-1679
9 TELE/CABLE BOX 400/SS
10 3" VENT PIPE, 3' HI
11 TELE/CABLE BOX 400/591
12 SIGN "CABLE ROUTE", SOUTHWEST BEL TEL CO., 800-435-1679
13 3" VENT, 10' HI
14 TELE/CABLE BOX 400/647
15 SIGN "CABLE ROUTE", SOUTHWEST BEL TEL CO., 800-435-1679
16 SIGN "CABLE ROUTE",#17, SOUTHWEST BEL TEL CO., 800-435-1679
17 TELE/CABLE BOX 400/685
18 TELE/CABLE BOX 400/471
#2 19 (100' SOUTH @ POWER POLE,) SIGN "CABLE ROUTE" SW BEL TEL CO.
#3 20 (2) 2" VENTS, (1) 3" VENT, (1) 1 1/2" CONDUIT
21 (2) 2" VENTS, (1) 3" VENT, SIGN "CABLE ROUTE", SW BEL TEL CO. #13
22 SIGN "CABLE ROUTE", SW BEL TEL CO. #13
23 TELE/CABLE BOX 400/1680
24 SIGN ON FENCE "UNDERGROUND POWER CABLE", 15000 VOLTS
25 TELE/CABLE BOX #14
26 TELE CO. 14" DIA X 30" HI
27 TELE/CABLE BOX #1401
28 TELE CO. 14" DIA X 30" HI
29 POWER POLE W/6" CONDUIT #2302 "BURIED ELECTRIC CABLES"
30 2" VENT
31 2" VENT X 8' HI
32 AT POWER POLE 2' X 2' X 30" HI SS ENCLOSURE "REMOTE CONTROLLED EQUIP.
#3 33 SIGN "CABLE ROUTE", SOUTHWEST BEL TEL CO., 800-435-1679
#4 34 SIGN: WARNING NATL. GAS PIPELINE
35 SIGN: WARNING NATL. GAS PIPELINE
36 SIGN: WARNING NATL. GAS PIPELINE
37 2" VENT
38 2" VENT
39 2" VENT
40 2" VENT (CUT OFF BELOW GRADE)
41 2" VENT
42 2" VENT
43 2" VENT
44 2" VENT
45 SIGN: NATL GAS PIPELINE, UNDERGROUND TELE CABLE # 1313
46 TELE/CABLE BOX
47 2" VENT WITH WARNING SIGN: PETROLEUM PIPELINE
48 2" VENT WITH WARNING SIGN: PETROLEUM PIPELINE
49 2" VENT WITH WARNING SIGN: PETROLEUM PIPELINE
#4 50 2" VENT WITH WARNING SIGN: PETROLEUM PIPELINE
#5

#5 51 2" VENT
52 2" VENT
53 3" PVC VENT W/CAP
54 3" PVC VENT W/CAP
55 2" VENT
56 2" VENT
57 3" VENT
58 3" VENT
59 2" VENT W/ 1" CONDUIT
60 2" VENT
61 SIGN: NATL GAS PIPELINE
62 2" VENT
63 2" VENT
64 2" VENT
65 2" VENT

FIGURE 3

NO.	DATE	REVISION	BY	CKD	APVD	APVD	DRAWING NO.	DESCRIPTION
1	11/7/14	UPDATED PER NEW CONSTRUCTION	WA	DEM				
0	1/6/10	DRAWN PER	TLH	RHT				

REFERENCED DRAWINGS

CHARGE:
B.O.M. NO.:
DATE: 6/8/11
SCALE: 1"=300'-0"
DRAWN: J.DIGBY
CHECKED:
APPROVED:
APPROVED:
APPROVED:
APPROVED:

WYNNEWOOD REFINING
A CVR REFINING, LP COMPANY
WYNNEWOOD, OKLAHOMA

WYNNEWOOD REFINERY SITE PLAN
CRUDE/PRODUCT LINES ROUTING AND LOCATION

DRAWING NUMBER	REV.
10-G-001	1

PREV. DWG 1500-P-96-006

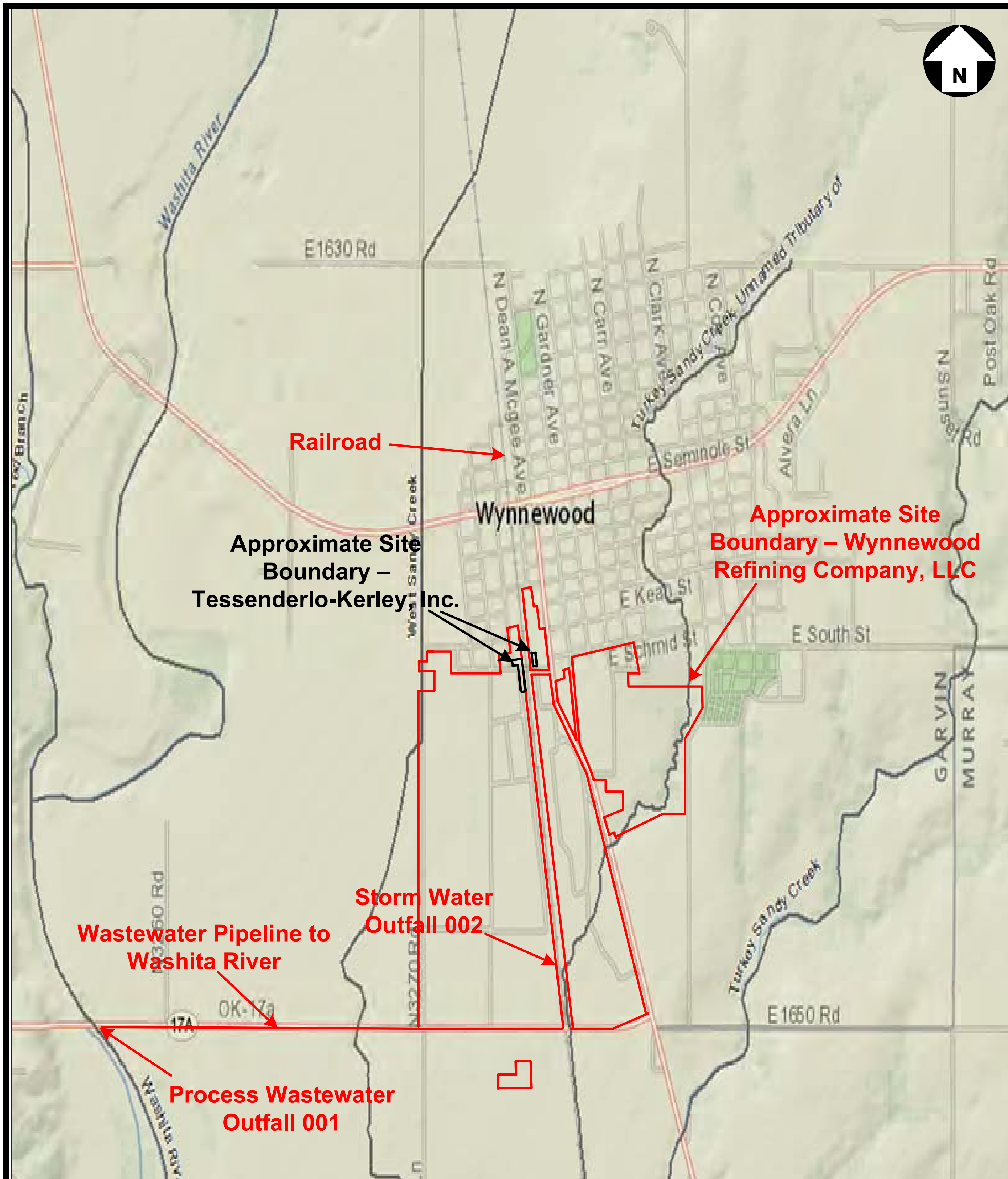
CAD# 28D COMBINED(36X24)

Appendix B

Site Location Maps

SOURCE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY WEBSITE

BOUNDARIES ARE APPROXIMATE



ENGlobal®

SITE MAP WYNNEWOOD REFINING COMPANY, LLC PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EIM, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.		
SCALE: NOT TO SCALE	DATE: 09/25/13	FIGURE NO. FIGURE 4
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE GOOGLE EARTH WEBSITE

BOUNDARIES ARE APPROXIMATE

ENGlobal®

Tessenderlo-Kerley, Inc. – Site Boundary
WYNNEWOOD REFINING COMPANY, LLC
PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EIM,
WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	09/25/13	FIGURE 5
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE: FEMA FLOOD INSURANCE RATE MAPS. PANEL NO. 40049C0295D

BOUNDARIES ARE APPROXIMATE

LEGEND

ZONE	EXPLANATION
A	AREAS OF 100-YEAR FLOODING
B	AREAS BETWEEN LIMITS OF THE 100-YEAR AND 500-YEAR FLOOD ZONE
C	AREAS OF MINIMAL FLOODING
X	AREAS LOCATED OUTSIDE THE 100-YEAR OR 500-YEAR FLOOD ZONES

ENGlobal®

FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD MAP
WYNNEWOOD REFINING COMPANY, LLC
PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EIM,
WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	09/25/13	FIGURE 6
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE: FEMA FLOOD INSURANCE RATE MAPS. PANEL NO. 40049C0450D

BOUNDARIES ARE APPROXIMATE

Note: FEMA has not completed a study to determine flood hazard for portions of unincorporated Murray County therefore a complete flood map is not available at this time.

LEGEND

ZONE	EXPLANATION
A	AREAS OF 100-YEAR FLOODING
B	AREAS BETWEEN LIMITS OF THE 100-YEAR AND 500-YEAR FLOOD ZONE
C	AREAS OF MINIMAL FLOODING
X	AREAS LOCATED OUTSIDE THE 100-YEAR OR 500-YEAR FLOOD ZONES

ENGlobal®

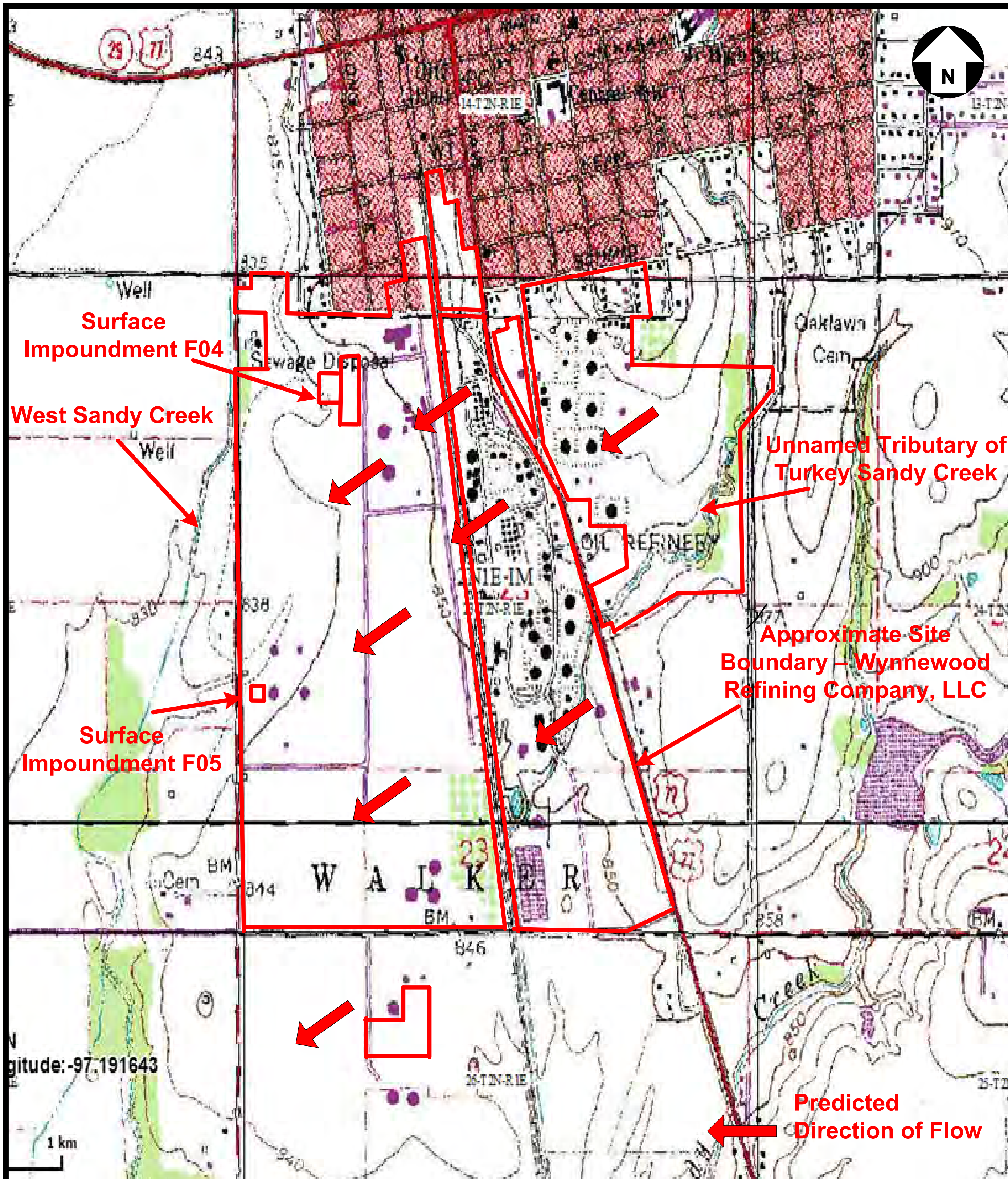
FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD MAP

WYNNEWOOD REFINING COMPANY, LLC

PRIMARILY SW¼ NE¼ NW¼ OF SECTION 26, TOWNSHIP 2 NORTH, RANGE 1 EIM, WYNNEWOOD, MURRAY COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	09/25/13	FIGURE 7
APPROVED BY:	DRAWN BY:	PROJECT NO.
DME	PCJ	10-130458

SOURCE: 7.5-MINUTE TOPOGRAPHIC MAP – OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY WEBSITE **BOUNDARIES ARE APPROXIMATE**



ENGlobal®

TOPOGRAPHIC MAP **WYNNEWOOD REFINING COMPANY, LLC** PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EIM, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.		
SCALE: NOT TO SCALE	DATE: 09/25/13	FIGURE NO. FIGURE 8
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE: NATURAL RESOURCE CONSERVATION SERVICE WEB SOIL SURVEY

BOUNDARIES ARE APPROXIMATE

LEGEND (GARVIN COUNTY)

21 ELANDCO SILTY CLAY LOAM, 0 OT 1 PERCENT SLOPES, OCCASIONALLY FLOODED
24 GARVIN AND ELANDCO SOILS, 0 OT 1 PERCENT SLOPES, FREQUENTLY FLOODED
38 KONAWA FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
44 LELA CLAY 0 TO 1 PERCENT SLOPES, RARELY FLOODED
71 TELLER FINE SANDY LOAM, 3 TO 5 PERCENT SLOPES, ERODED
74 TELLER LOAM, 0 TO 1 PERCENT SLOPES
75 TELLER LOAM, 1 TO 3 PERCENT SLOPES
78 TELLER-URBAN LAND COMPLEX, 0 TO 5 PERCENT SLOPES
81 URBAN LAND

LEGEND (MURRAY COUNTY)

3 BASTROP LOAM, 1 TO 5 PERCENT SLOPES, ERODED
5 BASTROP AND KONAWA SOILS, 3 TO 8 PERCENT SLOPES, GULLIED
24 ELANDCO SILT LOAM, 0 TO 1 PERCENT SLOPES, OCCASIONALLY FLOODED
40 KONAWA FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
55 TELLER LOAM, 0 TO 1 PERCENT SLOPES
56 TELLER LOAM 1 TO 3 PERCENT SLOPES
62 WATONGA SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES, RARELY FLOODED

ENGlobal®

SOIL MAP

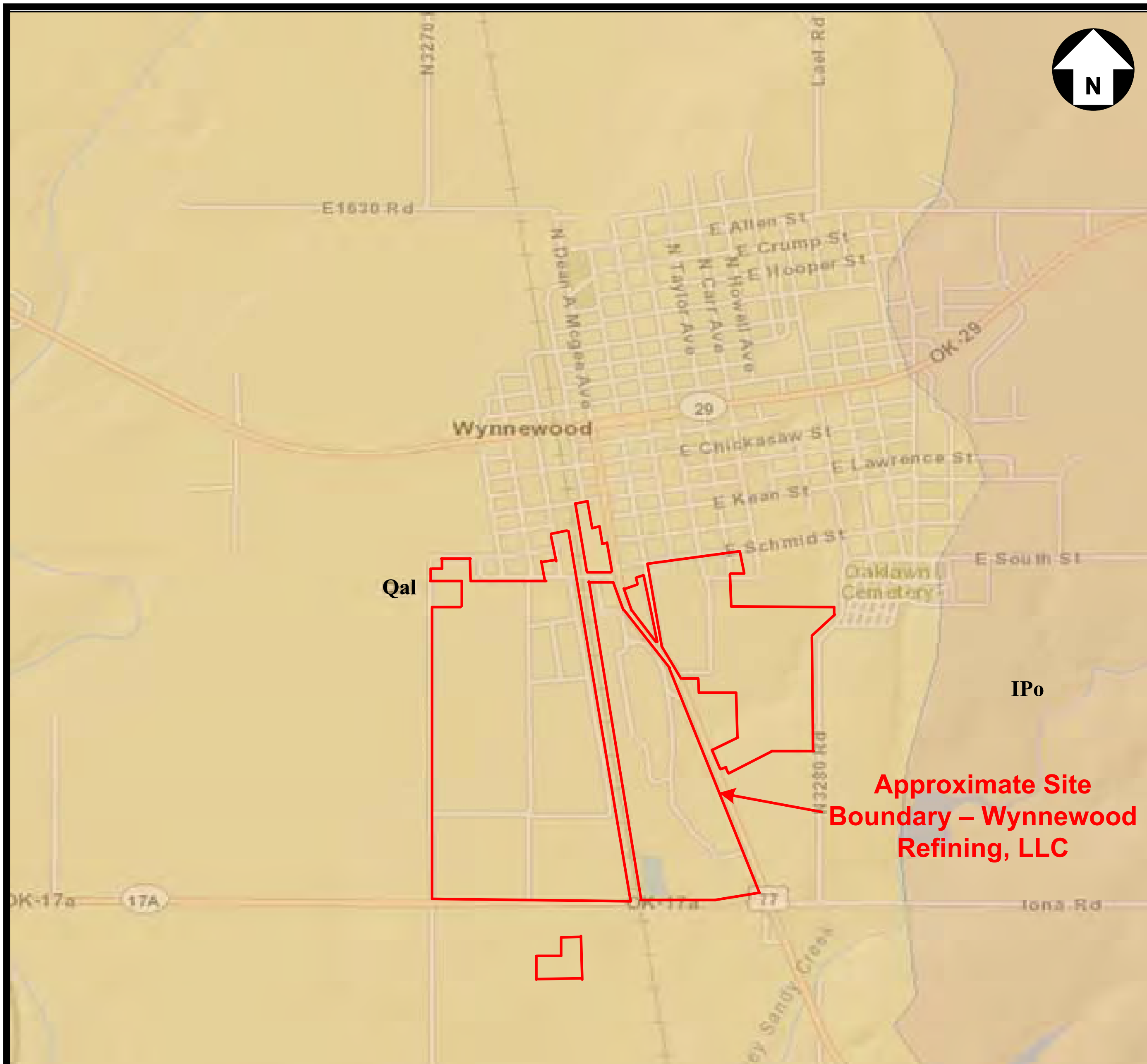
WYNNEWOOD REFINING COMPANY, LLC

PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EIM, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	09/25/13	FIGURE 9
APPROVED BY:	DRAWN BY:	PROJECT NO.
DME	PCJ	10-130458

SOURCE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY WEBSITE

BOUNDARIES ARE APPROXIMATE



Legend

IPo Oscar Group

Qal Alluvium

ENGlobal®

GEOLOGY MAP

WYNNEWOOD REFINING COMPANY, LLC

PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EAST, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	09/25/13	FIGURE 10
APPROVED BY:	DRAWN BY:	PROJECT NO.
DME	PCJ	10-130458

Appendix C

Certifications

Professional Engineer Certification

The undersigned Registered Professional Engineer is familiar with the requirements of Part 112 of Title 40 of the *Code of Federal Regulations* (40 C.F.R. Part 112) and has visited and examined the facility, or has supervised examination of the facility by appropriately qualified personnel.

The undersigned Registered Professional Engineer attests that this Spill Prevention, Control, and Countermeasure Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and the requirements of 40 C.F.R. Part 112; that procedures for required inspections and testing have been established; and that this Plan is adequate for the facility. This certification shall in no way relieve the owner/operator of the duty to prepare and fully implement this Plan in accordance with 40 C.F.R. Part 112.

Professional Engineer: Deren M. Ertugrul, P.E. SEAL

LICENSED PROFESSIONAL ENGINEER
DEREN M. ERTUGRUL
24595
OKLAHOMA

Signature: Deren M Ertugrul

Registration Number: 24595

State of Registration: Oklahoma

Date of Certification: 7/28/2015

Management Approval

WRC is committed to preventing the discharge of oil in quantities that may be harmful into or upon navigable waters of the United States and adjoining shorelines from the Wynnewood, Oklahoma facility. This Plan has the full approval of WRC management at a level of authority to commit the necessary resources to fully implement the Plan. WRC has committed the necessary resources to implement the measures described in this Plan.

The Vice President and General Manager is the Designated Person Accountable for Oil Spill Prevention at the facility and has the authority to commit the necessary resources to implement this Plan.

Authorized Facility Representative: Michael Swanson

Title: Vice President and General Manager

Signature: ______________________________

Date: ______________________________

Certification of the Applicability of the Substantial Harm Criteria

Facility Name: Wynnewood Refining Company, LLC

Facility Address: 906 South Powell Ave.
Wynnewood, OK 73098

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

   Yes No x

2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground storage tank area?

   Yes x No

3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in 40 C.F.R. Part 112 Appendix C, Attachment C-III or a comparable formula) such that discharge from the facility could cause injury to fish and wildlife and sensitive environments?

   Yes x No

4. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in 40 C.F.R. Part 112 Appendix C, Attachment C-III or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?

Yes No x

Certification of the Applicability of the Substantial Harm Criteria (Cont'd)

5. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years?

   Yes No x

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

______________________	______________________
Signature	Title
______________________	______________________
Name	Date

Appendix D

Plan Review Logs

Table 3

Five Year Review Log

Review Date	Plan Amendment		Name and Signature of Person Authorized to Review this Plan[1]
	Will Amend	Will Not Amend	
09/30/2003	Revised SPCC Plan Developed		Name: Dave Roderick Signature:
09/30/2008		Will not amend.	Name: Sidney G. Cabbiness Signature:
09/30/2013	Amending		Name: Sidney G. Cabbiness Signature:

[1] Pursuant to 40 C.F.R. §112.5(b), I have completed a review and evaluation of the SPCC Plan for WRC on the review date, and will (will not) amend the Plan as a result.

Table 4a
Administrative Amendment Log

Review Date	Revision Number	Description of Administrative Amendment	Revision Author	Revision Authorized By	Revision Approved By

Table 4b

Technical Amendment Log

Review Date	Revision Number	Description of Technical Amendment	P.E. Name	Licensing State	Registration Number
09/30/2013 through July 2015		Addition of Tessenderlo-Kerley, Inc. (TKI) to facility site plan.[1] Increase secondary containment capacity, i.e., raise berms on the following tankage areas, in accordance with implementation plan (Table 22A): • 150, 152, 154 and 155 • 147 • 146 • 126 and 202 • 111, 256 and 257 • 108, 110, 250 and 251 • 501 • 203-completed with construction of 204; combined containment of 203, 200, & 204 dikes • 136 and 138 • 252 and 253 • 1449-completed 2014 • 101 and 1324 • 67, 68, 69 and 70 • 303 Addition of the following processing units: Benfree Unit and Hydrogen Unit. Completed Nov. 2014 Commissioning of the following new tanks: 110, 204 and 71. Dikes for 71 and 204 (combined with 203 & 200 dikes) sized for 100% tk capacity plus freeboard for 25-yr 24-hr storm. Completed Dec. 2014 Addition of Crude Oil Tank Truck Unloading Area (LUA-11) Completed Feb. 2015	Deren M. Ertugrul, P.E.	OK	24595

[1] TKI is excluded from this Plan for purposes of SPCC compliance.

Table 4b
Technical Amendment Log

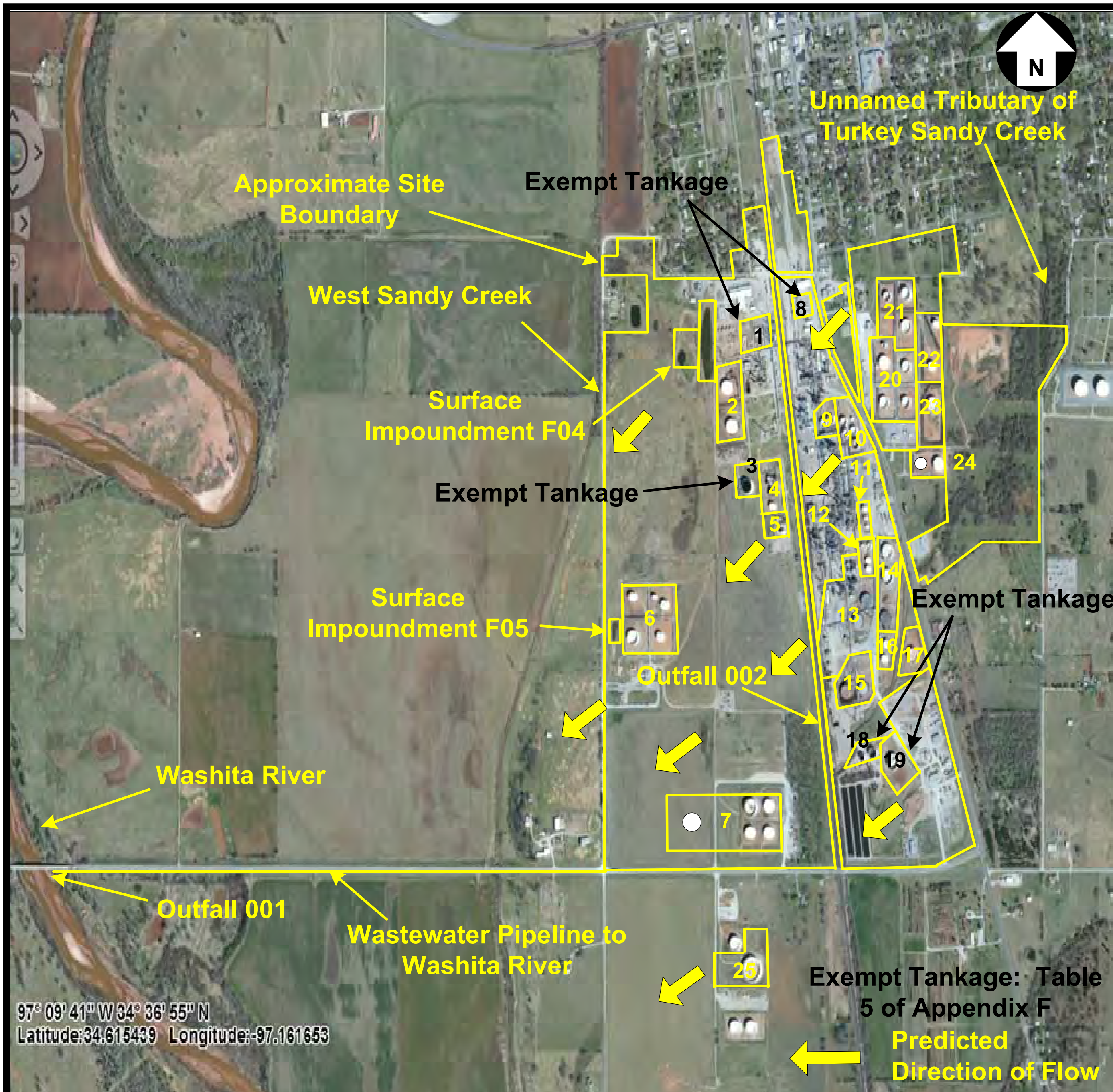
Review Date	Description of Technical Amendment	P.E. Name	Licensing State	Registration Number

Appendix E

Oil Storage Maps

SOURCE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY WEBSITE

BOUNDARIES ARE APPROXIMATE



Legend – Material Storage Areas

1 MSA - 1	7 MSA - 7	13 MSA - 13	19 MSA - 19	25 MSA - 25
2 MSA - 2	8 MSA - 8	14 MSA - 14	20 MSA - 20	
3 MSA - 3	9 MSA - 9	15 MSA - 15	21 MSA - 21	
4 MSA - 4	10 MSA - 10	16 MSA - 16	22 MSA - 22	
5 MSA - 5	11 MSA - 11	17 MSA - 17	23 MSA - 23	
6 MSA - 6	12 MSA - 12	18 MSA - 18	24 MSA - 24	

ENGlobal®

MATERIAL STORAGE AREAS MAP

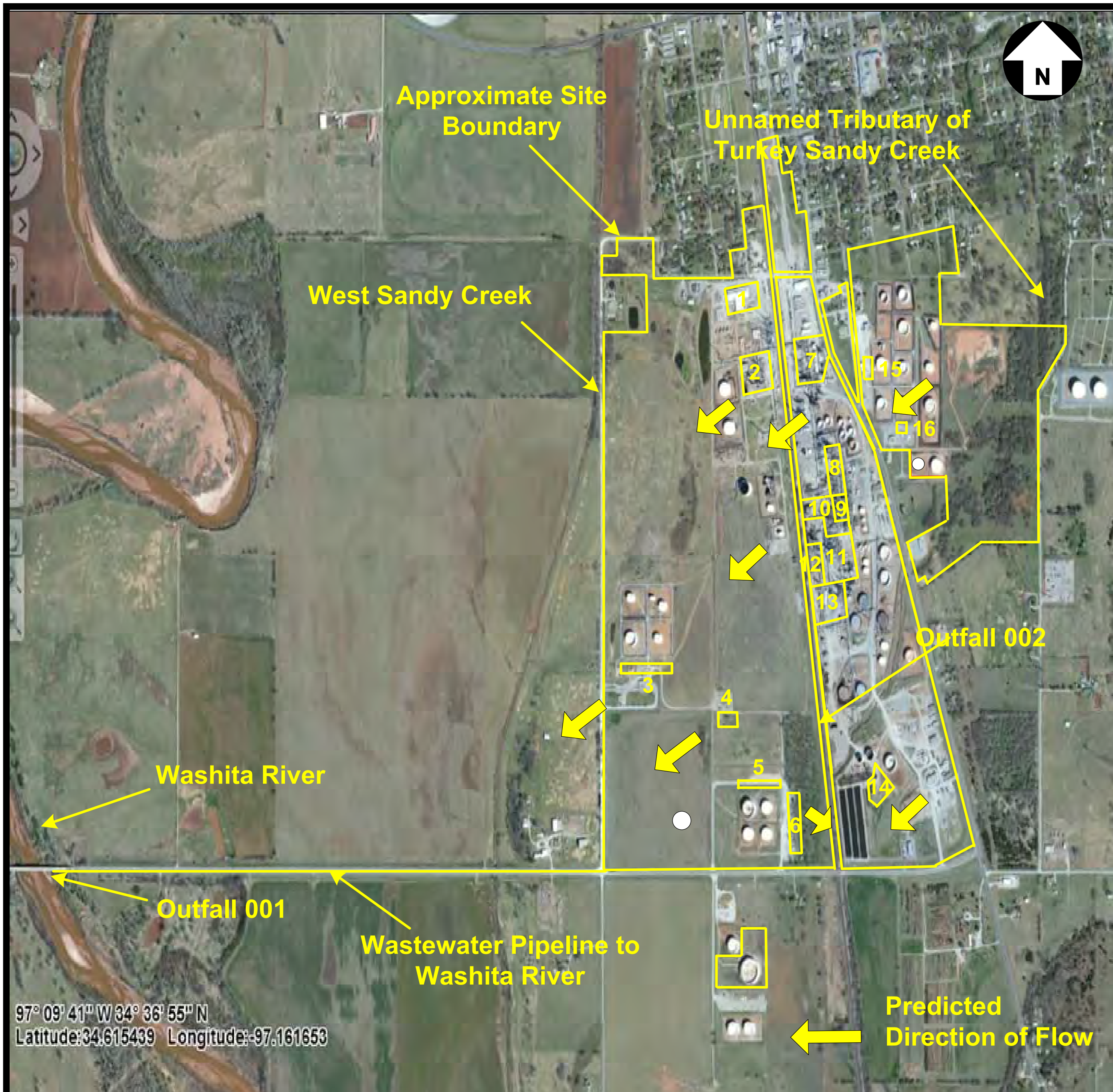
WYNNEWOOD REFINING COMPANY, LLC

PRIMARILY SECTION 23 TOWNSHIP 2 NORTH, RANGE 1 EAST, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	08/16/13	FIGURE 11
APPROVED BY:	DRAWN BY:	PROJECT NO.
DME	PCJ	10-130458

SOURCE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY WEBSITE

BOUNDARIES ARE APPROXIMATE



Legend – Mobile/Portable Storage Areas

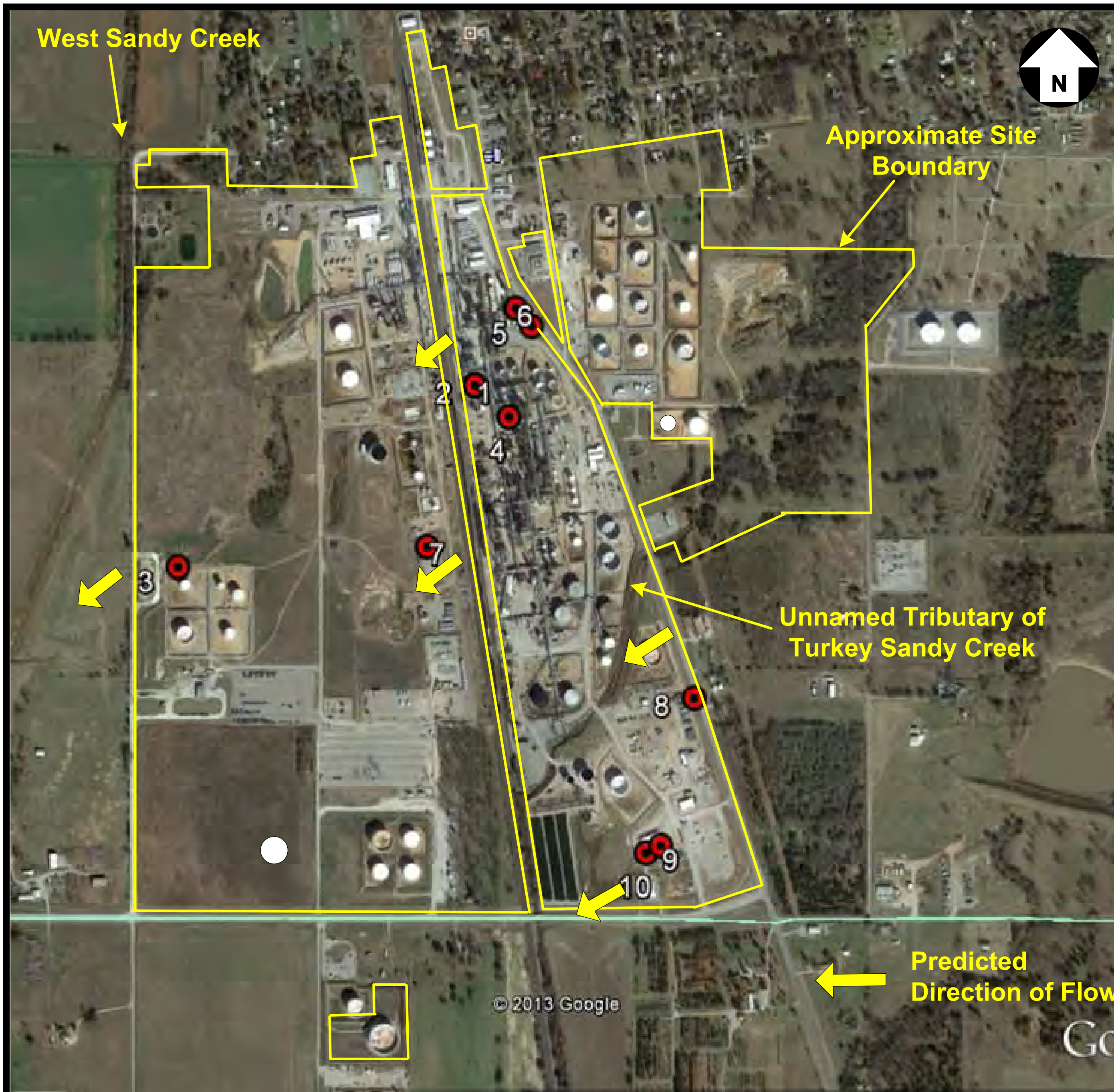
1	PMSA - 1	7	PMSA - 7	13	PMSA - 13
2	PMSA - 2	8	PMSA - 8	14	PMSA - 14
3	PMSA - 3	9	PMSA - 9	15	PMSA - 15
4	PMSA - 4	10	PMSA - 10	16	PMSA - 16
5	PMSA - 5	11	PMSA - 11		
6	PMSA - 6	12	PMSA - 12		

MOBILE/PORTABLE STORAGE AREAS MAP
WYNNEWOOD REFINING COMPANY, LLC
PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EAST,
WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	08/16/13	FIGURE 12
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE GOOGLE EARTH WEBSITE

BOUNDARIES ARE APPROXIMATE



Legend – Oil Filled Electrical Equipment

1	26-XF-01	6	40-XFRJR-2
2	26-XF-02	7	90-CC15XFR
3	40-EBXFR-01	8	90-XFR-002
4	40-XFR-001	9	90-XFR-003
5	40-XFRJ2-1	10	90-XFR-004

ENGlobal®

OIL-FILLED ELECTRICAL STORAGE AREAS MAP
WYNNEWOOD REFINING COMPANY, LLC
PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EAST,
WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	08/16/13	FIGURE 13
APPROVED BY:	DRAWN BY:	PROJECT NO.
DME	PCJ	10-130458

SOURCE GOOGLE EARTH WEBSITE

BOUNDARIES ARE APPROXIMATE

Legend – Oil Filled Electrical Equipment

11	90-XFR-005	16	C-4
12	A-30	17	C-5
13	A-31	18	D-37
14	A-37	19	D-42
15	B-8	20	D-44

ENGlobal®

OIL-FILLED ELECTRICAL STORAGE AREAS MAP

WYNNEWOOD REFINING COMPANY, LLC

PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EAST,
WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	08/16/13	FIGURE 14
APPROVED BY:	DRAWN BY:	PROJECT NO.
DME	PCJ	10-130458

SOURCE GOOGLE EARTH WEBSITE

BOUNDARIES ARE APPROXIMATE

Legend – Oil Filled Electrical Equipment

21	D-48	26	E-23
22	D-52	27	E-25
23	D-53	28	G-90
24	D-54	29	H-33
25	E-21	30	H-51

ENGlobal®

OIL-FILLED ELECTRICAL STORAGE AREAS MAP
WYNNEWOOD REFINING COMPANY, LLC
PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EAST,
WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	08/16/13	FIGURE 15
APPROVED BY:	DRAWN BY:	PROJECT NO.
DME	PCJ	10-130458

SOURCE GOOGLE EARTH WEBSITE

BOUNDARIES ARE APPROXIMATE

Legend – Oil Filled Electrical Equipment

31	H-52	36	H-64
32	H-53	37	H-65
33	H-60	38	H-67
34	H-62	39	H-68
35	H-63	40	H-70

ENGlobal®

OIL-FILLED ELECTRICAL STORAGE AREAS MAP
WYNNEWOOD REFINING COMPANY, LLC
PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EAST,
WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	08/16/13	FIGURE 16
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE GOOGLE EARTH WEBSITE **BOUNDARIES ARE APPROXIMATE**

Legend – Oil Filled Electrical Equipment

41	H-72	46	L-1	51	OG&E 69 KV/4.16 KV SUB	56	H-75
42	H-74	47	L-2	52	TR001		
43	ISOM	48	M-1	53	TR001C		
44	J-2	49	M-2	54	TR002		
45	K-70	50	M-2	55	West Flare		

ENGlobal®

OIL-FILLED ELECTRICAL STORAGE AREAS MAP
WYNNEWOOD REFINING COMPANY, LLC
PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EAST,
WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	08/16/13	FIGURE 17
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY WEBSITE

BOUNDARIES ARE APPROXIMATE

Legend – Oil-Filled Operating Equipment

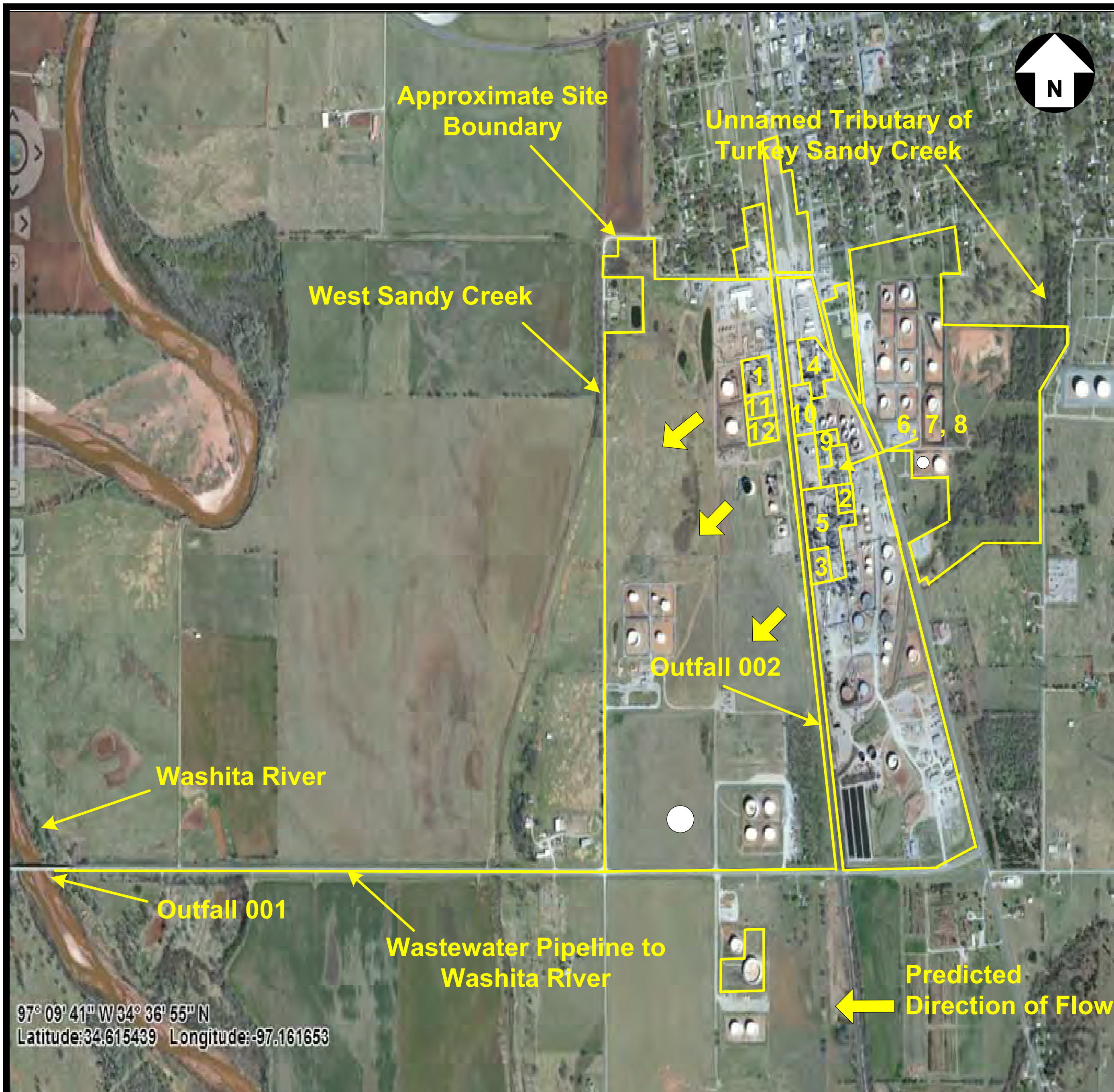
1 **Oil-Filled Operating Equipment (Diesel Day Tanks DT1183,1184 and 1185)**

ENGlobal®

OIL-FILLED OPERATING STORAGE AREAS MAP WYNNEWOOD REFINING COMPANY, LLC PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EAST, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.		
SCALE: NOT TO SCALE	DATE: 08/16/13	FIGURE NO. FIGURE 18
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY WEBSITE

BOUNDARIES ARE APPROXIMATE



Legend – Oil-Filled Manufacturing Equipment

1	HF Alkylation	6	Naphtha Hydrotreater	11 BenFree Unit
2	Hydrocracker	7	LSR Hydrotreater	12 Hydrogen Unit
3	Rose Unit	8	Platformer	(Shown for Informational
4	FCCU	9	Diesel Hydrotreater	Purposes Only)
5	Crude Distillation	10	Gasoline Hydrotreater	

ENGlobal®

OIL-FILLED MANUFACTURING MAP

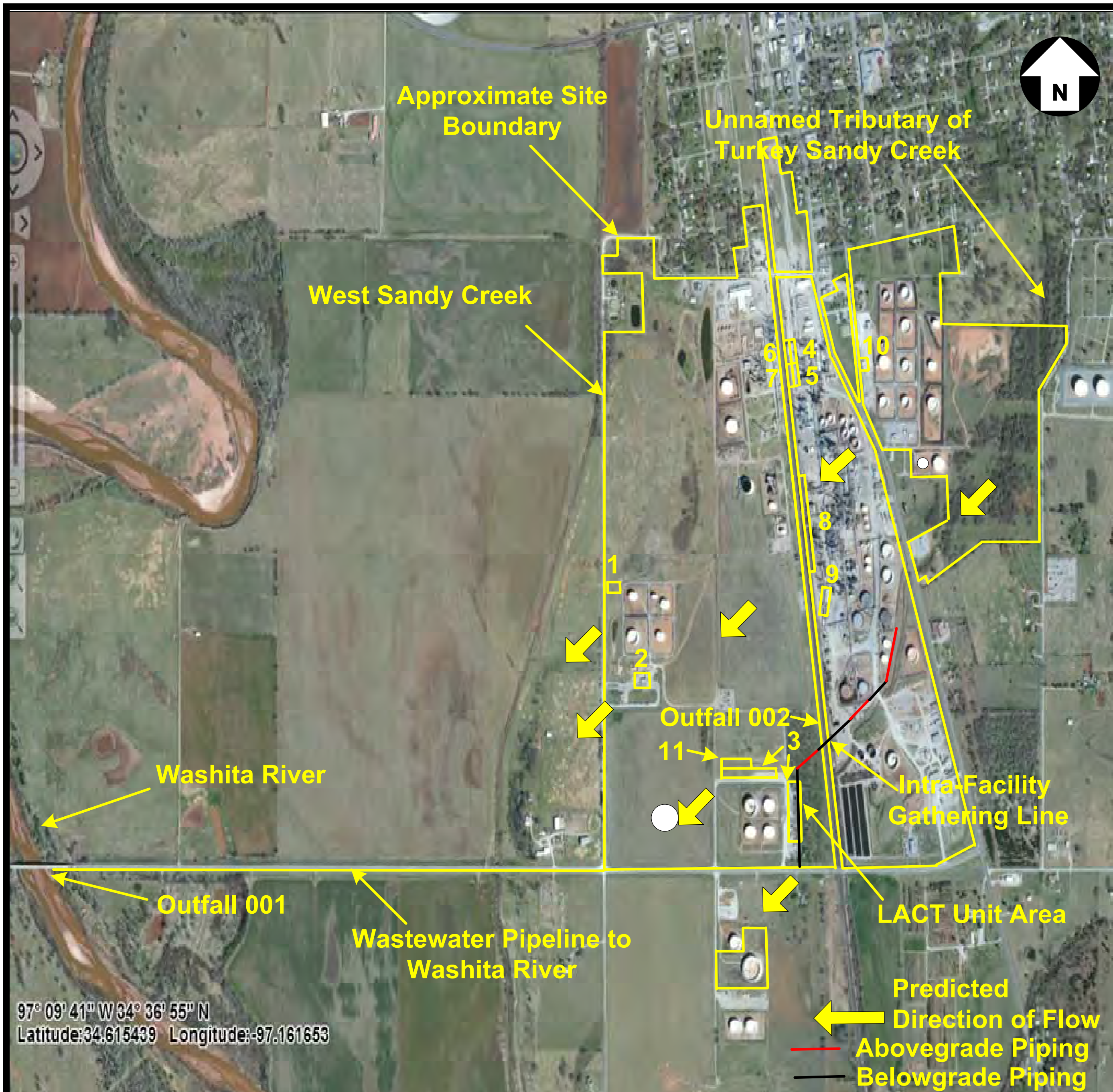
WYNNEWOOD REFINING COMPANY, LLC

PRIMARILY SECTION 23, TOWNSHIP 2 NORTH, RANGE 1 EAST, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	08/16/13	FIGURE 19
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY WEBSITE

BOUNDARIES ARE APPROXIMATE



Legend – Loading/Unloading Operations

1	LUA - 1	6	LUR – 6	11	LUA – 11
2	LUR - 2	7	LUA – 7		
3	LUA – 3	8	LUR – 8		
4	LUR – 4	9	LUR – 9		
5	LUR - 5	10	LUR - 10		

ENGlobal®

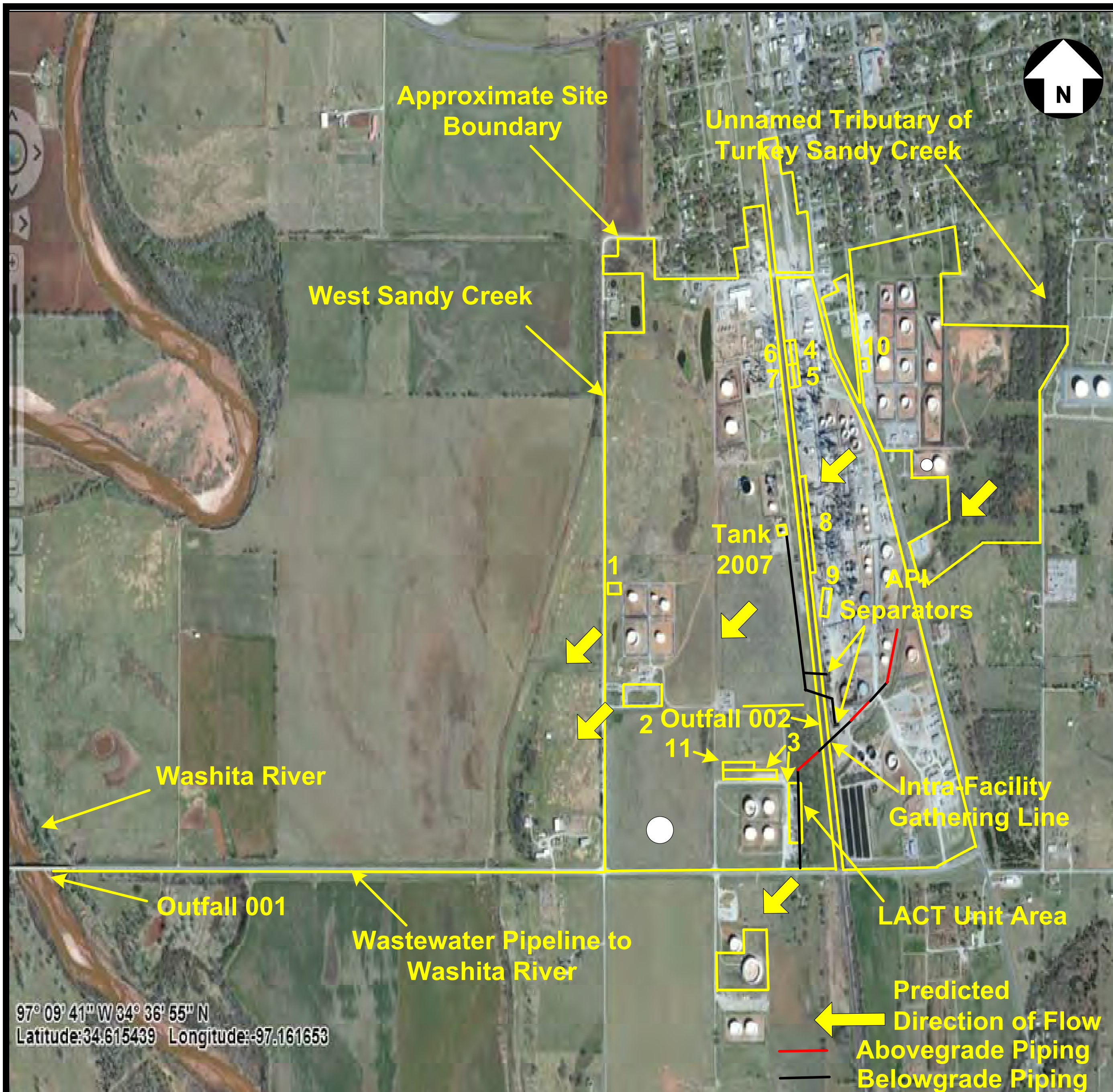
TRANSFER AREA - LOADING/UNLOADING OPERATIONS MAP

WYNNEWOOD REFINING COMPANY, LLC

PARTS OF SECTIONS 14, 23, AND 24, TOWNSHIP 2 NORTH, RANGE 1 EAST, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	08/16/13	FIGURE 20
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY WEBSITE **BOUNDARIES ARE APPROXIMATE**



Legend – Piping

1	LUA - 1	6	LUR – 6	11	LUA – 11
2	LUR - 2	7	LUA – 7		
3	LUA – 3	8	LUR – 8		
4	LUR – 4	9	LUR – 9		
5	LUR - 5	10	LUR - 10		

ENGlobal®

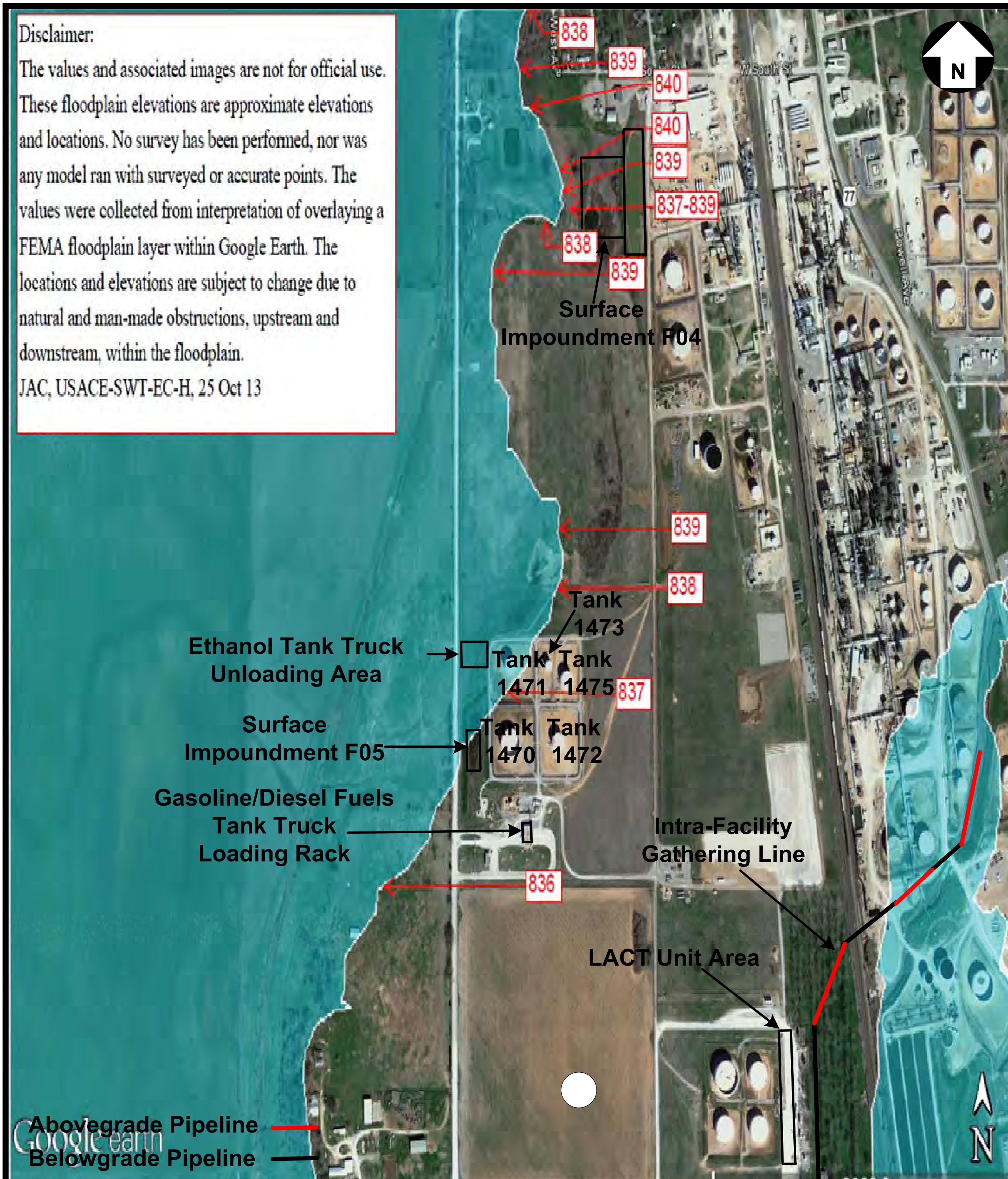
TRANSFER AREA - PIPING MAP

WYNNEWOOD REFINING COMPANY, LLC

PARTS OF SECTIONS 14, 23, AND 24, TOWNSHIP 2 NORTH, RANGE 1 EAST, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	08/16/13	FIGURE 21
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

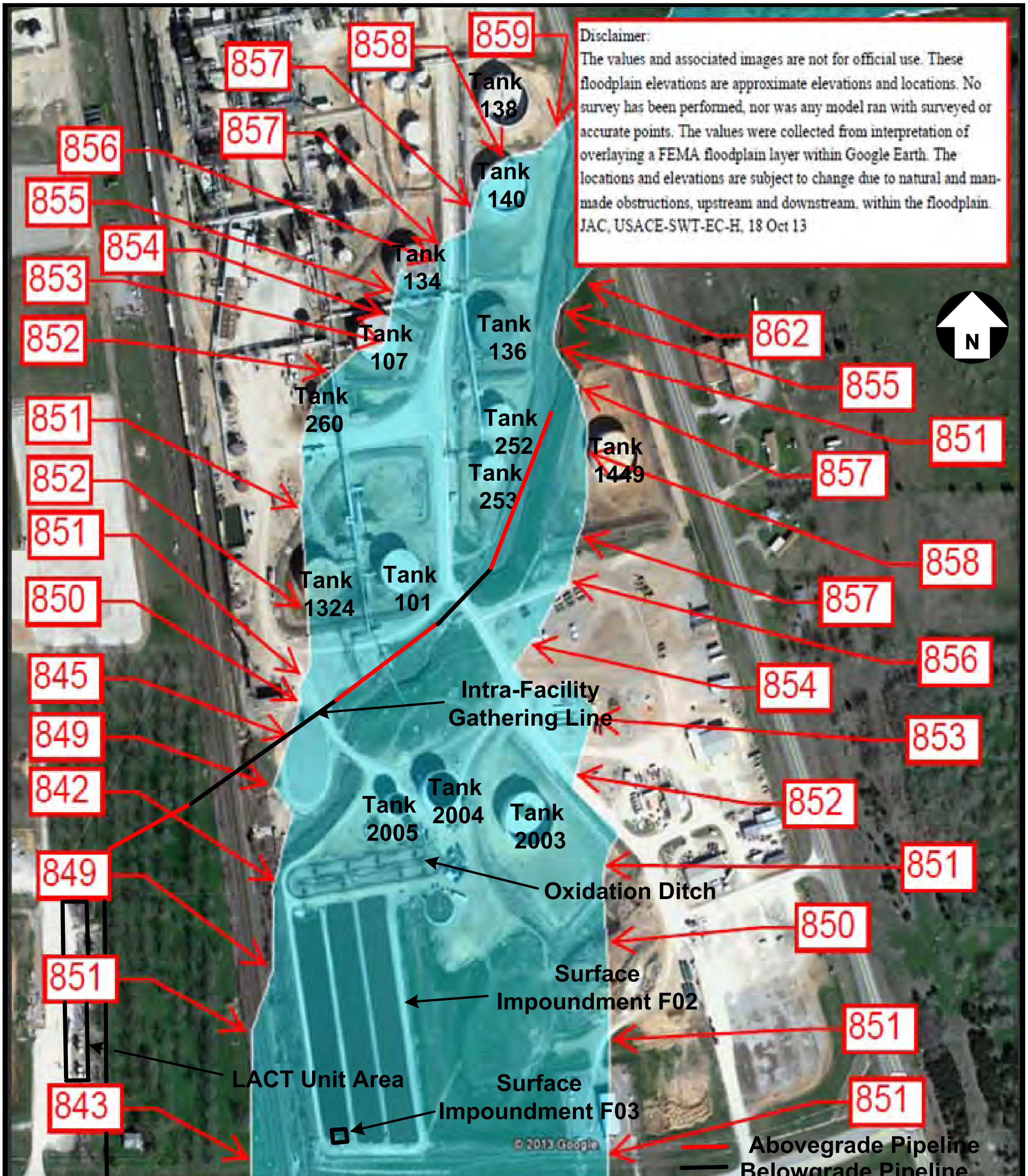
SOURCE: UNITED STATES ARMY CORPS OF ENGINEERS – TULSA DISTRICT OFFICE



ENGlobal®

BASE FLOOD ELEVATION – WEST SANDY CREEK WYNNEWOOD REFINING COMPANY, LLC PARTS OF SECTIONS 14, 23, AND 24, TOWNSHIP 2 NORTH, RANGE 1 EAST, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.		
SCALE: NOT TO SCALE	DATE: 09/25/13	FIGURE NO. FIGURE 22
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

SOURCE: UNITED STATES ARMY CORPS OF ENGINEERS – TULSA DISTRICT OFFICE



ENGlobal®

BASE FLOOD ELEVATION – UNNAMED TRIBUTARY TO TURKEY SANDY CREEK
WYNNEWOOD REFINING COMPANY, LLC
PARTS OF SECTIONS 14, 23, AND 24, TOWNSHIP 2 NORTH, RANGE 1 EAST, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE:	DATE:	FIGURE NO.
NOT TO SCALE	09/25/13	FIGURE 23
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

Appendix F

Oil Storage Inventory

Table 5

SPCC Exempt Tankage

Tank Number		Regulatory Citation
MSA – 1		
6D-1	D-191	67 FR 47076 (July 17, 1992)
6D-4	D-1401	
D-170	D-1402	
D-172	D-1403	
D-174	D-1404	
D-176	D-1405	
D-178	D-1406	
D-180	D-1407	
D-190	D-1408	
MSA – 3		
1181		40 C.F.R. §112.1(b)
MSA – 8		
182	185	67 FR 47076 (July 17, 1992)
183	186	
184	187	
MSA – 18		
2003		40 C.F.R. §112.1(d)(6)
MSA – 19		
2004	2005	40 C.F.R. §112.1(d)(6)

Table 6

Material Storage Areas – Containment, Overfill Protection, Testing and Inspections

Tank Number	Tank Material/Fabrication Type/ Foundation Design	Maximum Capacity (Bbls)	Contents	Type of Secondary Containment/ Drainage Control	Overfill Protection and Testing & Inspections
MSA-1					
6D-1[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	564	Alky Treat Charge	(18)	(18)
6D-4[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	564	Alky Treat Charge	(18)	(18)
D-170[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	712	Normal Butane	(18)	(18)
D-172[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	712	Normal Butane	(18)	(18)
D-174[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	712	Propane	(18)	(18)
D-176[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	712	Propane	(18)	(18)
D-178[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	712	Normal Butane	(18)	(18)
D-180[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	712	Iso-Butane	(18)	(18)
D-190[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	565	Alky Treat Charge	(18)	(18)
D-191[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	1,164	Alky Treat Charge	(18)	(18)
D-1401[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	1,581	Normal Butane	(18)	(18)
D-1402[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	1,581	Normal Butane	(18)	(18)
D-1403[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	1,581	Normal Butane	(18)	(18)
D-1404[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	1,581	Normal Butane	(18)	(18)
D-1405[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	1,581	Normal Butane	(18)	(18)
D-1406[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	2,143	Propylene	(18)	(18)
D-1407[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	2,143	Propylene	(18)	(18)
D-1408[1]	Steel Single Wall[3], Shop-Fabricated, Elevated on Supports	2,143	Propylene	(18)	(18)
MSA-2					
126[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	79,500	Gas Oil/LCO	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
202[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	80,000	Gas Oil	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
MSA-3					
1181[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Asphalt	100,000	Arbuckle Water	(16)	(16)
MSA-4					
951[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	10,000	**Out-of-Service**	--	--
953[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	10,000	**Out-of-Service**	--	--
2051[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	20,000	Sour Water	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
MSA-5					
2007[1]	Steel Single Wall[4], Field-Erected, Concrete Slab	5,100	API Separator Sludge	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)

Table 6 (Cont'd)

Material Storage Areas - Containment, Overfill Protection, Testing and Inspections

Tank Number	Tank Material/Fabrication Type/ Foundation Design	Maximum Capacity (Bbls)	Contents	Type of Secondary Containment/ Drainage Control	Overfill Protection and Testing & Inspections
MSA-6					
1470[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	79,600	Regular Unleaded	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
1471[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	34,800	Unleaded Premium	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
1472[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	34,700	Ultra Low Sulfur Diesel	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
1473[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	9,600	Unleaded Premium	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
1475[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	34,700	Ultra Low Sulfur Diesel	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
1476[1]	Steel Single Wall[4], Shop-fabricated, Concrete Slab	170	**Out-of-Service**	--	--
MSA-7					
67[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	68,884	Crude Oil	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
68[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	68,884	Crude Oil	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
69[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	68,884	Crude Oil	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
70[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Asphalt	150,000	Crude Oil	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
71[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Asphalt	250,000	Crude Oil	(5, 6, 7, 8)	(10, 11, 12, 13, 14, 15)
MSA-8					
182[1]	Steel Single Wall[3], Field-Erected, Elevated on Supports	1,427	Mixed Butane	(18)	(18)
183[1]	Steel Single Wall[3], Field-Erected, Elevated on Supports	1,427	Mixed Butane	(18)	(18)
184[1]	Steel Single Wall[3], Field-Erected, Elevated on Supports	1,533	Mixed Butane	(18)	(18)
185[1]	Steel Single Wall[3], Field-Erected, Elevated on Supports	1,533	Iso-Butane	(18)	(18)
186[1]	Steel Single Wall[3], Field-Erected, Elevated on Supports	2,370	Iso-Butane	(18)	(18)
187[1]	Steel Single Wall[3], Field-Erected, Elevated on Supports	2,400	Iso-Butane	(18)	(18)
MSA-9					
254[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	24,800	Cat Gasoline	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
255[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	24,800	Straight Run Gasoline	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
MSA-10					
150[1]	Steel Single Wall[4], Field-Erected, Sand	24,800	Platformate	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
152[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Asphalt	24,800	Platformate	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
154[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	24,800	Gasoline	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
155[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Asphalt	40,000	Sour Naptha	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
156[1]	Steel Single Wall[4], Field-Erected, Unknown	2,500	**Out-of-Service**	--	--

Table 6 (Cont'd)
Material Storage Areas - Containment, Overfill Protection, Testing and Inspections

Tank Number	Tank Material/Fabrication Type/ Foundation Design	Maximum Capacity (Bbls)	Contents	Type of Secondary Containment/ Drainage Control	Overfill Protection and Testing & Inspections
MSA-11					
111[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	5,000	JP-8	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
256[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	5,000	JP-5	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
257[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	10,000	Unified Naphtha	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
MSA-12					
108[1]	Steel Single Wall[4], Field-Erected, Sand	13,800	JP-8	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
110[1]	Steel Single Wall[4], Field-Erected, Sand	15,000	Light Cycle Oil/DSL	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
250[1]	Steel Single Wall[4], Field-Erected, Sand	10,000	KW1-1/100W	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
251[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	10,000	100W	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
MSA-13					
107[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	78,000	Asphalt (64-22)	(5, 6, 7, 8, 9, 19)	(10, 11, 12, 13, 14, 15)
120[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	2,800	**Out-of-Service**	--	--
134[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	80,000	Asphalt VTB/64-22	(5, 6, 7, 8, 9, 19)	(10, 11, 12, 13, 14, 15)
260[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	5,100	Light Distillate	(7, 9)	(10, 11, 12, 13, 14, 15)
262[1]	Steel Single Wall[4], Field-Erected, Sand	5,100	Dirty VAS Gas Oil	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
263[1]	Steel Single Wall[4], Field-Erected, Sand	5,100	Slop Oil	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
264[1]	Steel Single Wall[4], Field-Erected, Sand	5,100	Asphalt	(5, 6, 7, 8, 9, 19)	(10, 11, 12, 13, 14, 15)
265[1]	Steel Single Wall[4], Field-Erected, Sand	5,100	PMA Base Stock	(5, 6, 7, 8, 9, 19)	(10, 11, 12, 13, 14, 15)
269[1]	Steel Single Wall[4], Field-Erected, Sand	5,100	MC Base Asphalt	(5, 7, 9, 19)	(10, 11, 12, 13, 14, 15)
601[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	5,000	Asphalt Resins	(5, 6, 7, 8, 9, 19)	(10, 11, 12, 13, 14, 15)
1321[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	5,000	Roofing Asphalt	(5, 7, 9, 19)	(10, 11, 12, 13, 14, 15)
1323[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	4,512	Coating Asphalt	(5, 7, 9, 19)	(10, 11, 12, 13, 14, 15)
1331[1]	Steel Single Wall[4], Field-Erected, Concrete Slab	5,000	PMA Asphalt	(5, 6, 7, 8, 9, 19)	(10, 11, 12, 13, 14, 15)
1332[1]	Steel Single Wall[4], Field-Erected, Concrete Slab	5,000	PMA Asphalt	(5, 6, 7, 8, 9, 19)	(10, 11, 12, 13, 14, 15)
1333[1]	Steel Single Wall[4], Field-Erected, Concrete Slab	5,000	PMA Asphalt	(5, 6, 7, 8, 9, 19)	(10, 11, 12, 13, 14, 15)
1337[2]	Steel Single Wall[4], Field-Erected, Concrete Slab	2,000	**Closed**	--	--
1338[2]	Steel Single Wall[4], Field-Erected, Concrete Slab	2,000	**Closed**	--	--
2002[1]	Steel Single Wall[4], Shop-fabricated, Concrete Slab	100	**Out-of-Service**	--	--
MSA-14					
136[1]	Steel Single Wall[4], Field-Erected, Sand	75,470	Asphalt VTB	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
138[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Asphalt	80,000	Light Distillate	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
140[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Asphalt	80,000	Heavy Distillate	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)

Table 6 (Cont'd)
Material Storage Areas - Containment, Overfill Protection, Testing and Inspections

Tank Number	Tank Material/Fabrication Type/ Foundation Design	Maximum Capacity (Bbls)	Contents	Type of Secondary Containment/ Drainage Control	Overfill Protection and Testing & Inspections
MSA-15					
101[1]	Steel Single Wall[4], Field-Erected, Sand	64,000	Asphalt VTB	(5, 6, 7, 8, 9, 19)	(10, 11, 12, 13, 14, 15)
1324[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	66,590	Asphalt VTB/64-22	(5, 6, 7, 8, 9, 19)	(10, 11, 12, 13, 14, 15)
MSA-16					
252[1]	Steel Single Wall[4], Field-Erected, Sand	26,800	Slurry Oil	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
253[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	25,000	Ultra Low Sulfur Diesel	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
MSA-17					
1449[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	76,425	Raw Crude	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
MSA-18					
2003[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	86,000	Storm Water	(16)	(16)
MSA-19					
2004[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	54,356	Waste Water	(17)	(17)
2005[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	20,000	Waste Water	(17)	(17)
MSA-20					
142[1]	Steel Single Wall[4], Field-Erected, Sand	55,000	Unleaded Gasoline	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
143[1]	Steel Single Wall[4], Field-Erected, Sand	55,000	Unleaded Gasoline	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
144[1]	Steel Single Wall[4], Field-Erected, Sand	55,000	Unleaded Gasoline	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
146[1]	Steel Single Wall[4], Field-Erected, Sand	80,000	Unleaded Gasoline	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
164[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	10,000	LUK	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
MSA-21					
147[1]	Steel Single Wall[4], Field-Erected, Sand	80,000	Cat Gasoline	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
148[1]	Steel Single Wall[4], Field-Erected, Sand	75,900	Unleaded Gasoline	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
168[1]	Steel Single Wall[4], Field-Erected, Sand	35,700	Alkylate Gasoline	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
MSA-22					
501[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	25,700	JP-8	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
1441[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	35,700	JP-8	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
MSA-23					
203[1]	Steel Single Wall[4], Field-Erected, Conc. Ringwall/Asphalt	80,000	Ultra Low Sulfur Diesel	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
MSA-24					
200[1]	Steel Single Wall[4], Field-Erected, Conc. Ringwall/Asphalt	80,000	Low Sulfur Diesel	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
204[1]	Steel Single Wall[4], Field-Erected, Conc. Ringwall/Asphalt	150,000	Diesel	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
MSA-25					
303[1]	Steel Single Wall[4], Field-Erected, Concrete Ringwall/Sand	250,000	Raw Crude	(5, 6, 7, 8, 9)	(10, 11, 12, 13, 14, 15)
Total Aboveground Bulk Storage Capacity: 2,766,647 bbls					

Table 6 Legend

[1] Active (currently contains liquid substances or temporarily empty and resumption of storage is anticipated within one year or contains no liquid substances but has not been closed according to 40 C.F.R. 112.2).
[2] Closed (currently contains no liquid substances and resumption of storage is not anticipated within one year and tank has been closed in accordance with 40 C.F.R. 112.2).
[3] Constructed in accordance with STI standards and compatible with the material stored and the conditions of storage, i.e., pressure and temperature.
[4] Constructed in accordance with API standards and compatible with the material stored and the conditions of storage, i.e., pressure and temperature.
[5] A sufficiently impervious floor and berm which is capable of containing the oil until the time at which cleanup occurs (Table 20 of Appendix H).
[6] Sufficient freeboard as determined in Table 22 of Appendix L.
[7] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[8] Drainage of uncontaminated storm water is not allowed from the bermed area unless inspected prior to discharge to storm water outfall 002, or unless discharged to refinery sewer system. Facility normally keeps the bypass valve sealed closed; inspects the retained storm water to ensure that its presence will not cause a discharge; opens the bypass valve and reseals it.
[9] Drainage to refinery sewer system which is capable of holding the contents of the process units and piping consisting of approximately 91,714 barrels (based on the September 24, 2003 SPCC).
[10] An oil spill contingency plan and a written commitment of manpower, equipment and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful to any navigable water or adjoining shoreline.
[11] High liquid level alarm with an audible or visual signal at a constantly attended operation or surveillance station.
[12] Liquid level sensing devices must be regularly tested to ensure proper operation.
[13] Monthly visual inspections by qualified WRC personnel performed in accordance with Tables 24 of Appendix M and in combination with another testing technique such as hydrostatic testing or another system of non-destructive shell testing performed by certified personnel in accordance with API 653.
[14] WRC personnel periodically inspect the outside of each container for signs of deterioration, discharges, or accumulation of oil inside bermed areas.
[15] If field-constructed aboveground containers undergo a repair, alternation, reconstruction and, or a change in service that might affect the risk of a discharge or failure due to brittle fracture or other catastrophe, or has discharge oil or failed due to brittle fracture failure or other catastrophe, the container is evaluated for risk of discharge or failure due to brittle fracture or other catastrophe and appropriate actions taken.
[16] Exempt pursuant to 40 C.F.R. 112.1(b).
[17] Exempt pursuant to 40 C.F.R. 112.1(d)(6).
[18] Exempt pursuant to 67 FR 47076 dated July 17, 2002.
[19] Exempt pursuant to 40 C.F.R. 112.1(d)(8), product will rapidly solidify.

Table 7
Portable Material Storage Areas – Containment, Overfill Protection, Testing and Inspections

Unit or Tank ID	Type of Container	Typical Container Capacity, gallons	Contents	Typical Number of Containers in Area	Type of Secondary Containment/ Drainage Control	Overfill Protection and Testing & Inspections
PMSA – 1						
IT-1	(1, 2)	2,000	Gasoline	1	(3)	(4, 5)
IT-2	(1, 2)	1,000	Diesel	1	(3)	(4, 5)
PMSA – 2						
IT-33	(1, 2)	564	Corrosion Inhibitor	1	(3)	(4, 5)
PMSA – 3						
141	(1, 2)	8,000	Cetane	1	(3)	(4, 5)
1413	(1, 2)	8,000	Fuel Additive	1	(3)	(4, 5)
1414	(1, 2)	6,000	Fuel Additive	1	(3)	(4, 5)
1415	(1, 2)	4,000	Fuel Additive	1	(3)	(4, 5)
1416	(1, 2)	3,000	Fuel Additive	1	(3)	(4, 5)
1417	(1, 2)	2,000	Fuel Additive	1	(3)	(4, 5)
1418	(1, 2)	2,000	Fuel Additive	1	(3)	(4, 5)
1419	(1, 2)	Unknown	Fuel Additive	1	(3)	(4, 5)
1424	(1, 2)	2,000	Diesel Additive	1	(3)	(4, 5)
1425	(1, 2)	1,000	Blue Diesel Dye	1	(3)	(4, 5)
1426	(1, 2)	1,000	Fuel Additive	1	(3)	(4, 5)
1486	(1, 2)	1,000	Blue Diesel Dye	1	(3)	(4, 5)
PMSA – 4						
1901	(1, 2)	170	Petroleum	1	(3)	(4, 5)
PMSA – 5[6]						
53	(1, 2)	16,800	Raw Crude Oil	1	(3)	(4, 5)
54	(1, 2)	16,800	Raw Crude Oil	1	(3)	(4, 5)
55	(1, 2)	16,800	Raw Crude Oil	1	(3)	(4, 5)
PW01	(1, 2)	Unknown	Raw Crude Oil	1	(3)	(4, 5)
PW02	(1, 2)	Unknown	Raw Crude Oil	1	(3)	(4, 5)
PW03	(1, 2)	Unknown	Raw Crude Oil	1	(3)	(4, 5)

Table 7 (Cont'd)

Portable Material Storage Areas – Containment, Overfill Protection, Testing and Inspections

Unit or Tank ID	Type of Container	Typical Container Capacity, gallons	Contents	Typical Number of Containers in Area	Type of Secondary Containment/ Drainage Control	Overfill Protection and Testing & Inspections
PMSA – 6[6]						
(4)	(1, 2)	Unknown	Raw Crude Oil	1	(3)	(4, 5, 6)
(4)	(1, 2)	Unknown	Raw Crude Oil	1	(3)	(4, 5, 6)
W1	(1, 2)	Unknown	Raw Crude Oil	1	(3)	(4, 5, 6)
W2	(1, 2)	Unknown	Raw Crude Oil	1	(3)	(4, 5, 6)
(6)	(1, 2)	Unknown	Raw Crude Oil	1	(3)	(4, 5, 6)
(6)	(1, 2)	Unknown	Raw Crude Oil	1	(3)	(4, 5, 6)
1501	(1, 2)	Unknown	Raw Crude Oil	1	(3)	(4, 5, 6)
1502	(1, 2)	400	Raw Crude Oil	1	(3)	(4, 5, 6)
1503	(1, 2)	400	Raw Crude Oil	1	(3)	(4, 5, 6)
65	(1, 2)	400	Raw Crude Oil	1	(3)	(4, 5, 6)
PMSA – 7						
IT-3	(1, 2)	1,975	Lube Oil	1	(3)	(4, 5)
IT-5	(1, 2)	1,000	Lube Oil	1	(3)	(4, 5)
IT-9	(1, 2)	1,000	Corrosion Inhibitor	1	(3)	(4, 5)
IT-10	(1, 2)	1,000	Corrosion Inhibitor	1	(3)	(4, 5)
IT-19	(1, 2)	2,325	Solvent Cleaner	1	(3)	(4, 5)
IT-21	(1, 2)	1,600	Corrosion Inhibitor	1	(3)	(4, 5)
IT-23	(1, 2)	750	Corrosion Inhibitor	1	(3)	(4, 5)
IT-34	(1, 2)	560	Corrosion Inhibitor	1	(3)	(4, 5)
IT-36	(1, 2)	1,000	Corrosion Inhibitor	1	(3)	(4, 5)
IT-40	(1, 2)	6,428	Corrosion Inhibitor	1	(3)	(4, 5)
PMSA – 8						
IT-4	(1, 2)	1,321	Lube Oil	1	(3)	(4, 5)
IT-32	(1, 2)	560	Corrosion Inhibitor	1	(3)	(4, 5)
PMSA – 9						
IT-18	(1, 2)	3,171	Lube Oil	1	(3)	(4, 5)
PMSA – 10						
IT-11	(1, 2)	2,000	Demulsifier	1	(3)	(4, 5)
IT-24	(1, 2)	1,000	Corrosion Inhibitor	1	(3)	(4, 5)
IT-25	(1, 2)	750	Corrosion Inhibitor	1	(3)	(4, 5)
IT-29	(1, 2)	750	Corrosion Inhibitor	1	(3)	(4, 5)
IT-41	(1, 2)	2,000	Anti-foulant	1	(3)	(4, 5)

Table 7 (Cont'd)

Portable Material Storage Areas – Containment, Overfill Protection, Testing and Inspections

Unit or Tank ID	Type of Container	Typical Container Capacity, gallons	Contents	Typical Number of Containers in Area	Type of Secondary Containment/ Drainage Control	Overfill Protection and Testing & Inspections
PMSA -10 (Cont'd)						
IT-11	(1, 2)	2,000	Demulsifier	1	(3)	(4, 5)
IT-37	(1, 2)	560	Corrosion Inhibitor	1	(3)	(4, 5)
PMSA – 11						
IT-7	(1, 2)	1,000	Corrosion Inhibitor	1	(3)	(4, 5)
IT-8	(1, 2)	750	Corrosion Inhibitor	1	(3)	(4, 5)
IT-26	(1, 2)	750	Corrosion Inhibitor	1	(3)	(4, 5)
IT-27	(1, 2)	1,000	Corrosion Inhibitor	1	(3)	(4, 5)
IT-30	(1, 2)	1,000	Corrosion Inhibitor	1	(3)	(4, 5)
IT-31	(1, 2)	750	Corrosion Inhibitor	1	(3)	(4, 5)
IT-42	(1, 2)	1,000	Anti-foulant	1	(3)	(4, 5)
PMSA – 12						
IT-13	(1, 2)	250	Demulsifier	1	(3)	(4, 5)
IT-35	(1, 2)	673	Corrosion Inhibitor	1	(3)	(4, 5)
6092	(1, 2)	5,600	Fuel Additive	1	(3)	(4, 5)
PMSA – 13						
IT-22	(1, 2)	765	Corrosion Inhibitor	1	(3)	(4, 5)
PMSA – 14						
2001	AST vertical	21,000	Oily Wastewater	1	(3)	(4, 5)
2002	AST vertical	4,200	Oily Wastewater	1	(3)	(4, 5)
PMSA – 15						
IT-19	(1, 2)	2,325	Solvent Cleaner		(3)	(4, 5)
PMSA – 16						
IT-37	(1, 2)	560	Corrosion Inhibitor	1	(3)	(4, 5)
Total Mobile/Portable Bulk Storage Capacity: 3,047 bbls						

[1] Steel single wall shop-fabricated container.
[2] Constructed in accordance with STI standards and compatible with the material stored and the conditions of storage, i.e., pressure and temperature.
[3] A land-based spill response kit which is capable of preventing the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[4] Mobile/portable containers are refilled in accordance with the procedure described in Section 8.5.3 of this Plan.
[5] Qualified WRC personnel will perform monthly and annual visual inspections in combination with an environmentally equivalent integrity testing method. Any deficiencies identified are promptly corrected.
[6] Tanks are not owned by WRC and are shown for information purposes only. These tank owners have their own SPCC plans. LACT spill prevention procedures are described in Appendix I.

Table 8

Oil-Filled Electrical Equipment – Containment, Overfill Protection, Testing and Inspections

Map ID	Unit No.	Transformer (kVA)	Serial Number	Type of Container	Volume of Oil (Gallons)	Type of Oil	Type of Secondary Containment/ Drainage Control	Overfill Protection and Testing & Inspections
1	26-XF-01	2,500	3403914409	(1, 2)	476	Natural Ester	(3)	(4, 5)
2	26-XF-02	2,500	3390094309	(1, 2)	455	Natural Ester	(3)	(4, 5)
3	40-EBXFR-01	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
4	40-XFR-001	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
5	40-XFRJ2-1	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
6	40-XFRJ2-2	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
7	90-CC15XFR	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
8	90-XFR-002	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
9	90-XFR-003	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
10	90-XFR-004	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
11	90-XFR-005	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
12	A-30	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
13	A-31	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
14	A-37	1,000	PB4302	(1, 2)	223	Mineral Oil	(3)	(4, 5)
15	B-8	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
16	C-4	1,500	01J423222	(1, 2)	419	High MW Oil	(3)	(4, 5)
17	C-5	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
18	D-37	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
19	D-42	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
20	D-44	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
21	D-48	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
22	D-52	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
23	D-53	300	0526001712	(1, 2)	258	Mineral Oil	(3)	(4, 5)
24	D-54	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
25	E-21	1,000	12E81	(1, 2)	308	Mineral Oil	(3)	(4, 5)
26	E-23	1,000	866003437	(1, 2)	328	Mineral Oil	(3)	(4, 5)
27	E-25	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
28	G-90	1,000	920690A1	(1, 2)	375	Mineral Oil	(3)	(4, 5)
29	H-33	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
30	H-51	1,000	G762452	(1, 2)	453	Mineral Oil	(3)	(4, 5)
31	H-52	1,000	G762451	(1, 2)	453	Mineral Oil	(3)	(4, 5)
32	H-53	1,000	G76246	(1, 2)	354	Mineral Oil	(3)	(4, 5)

Table 8 (Cont'd)

Oil-Filled Electrical Equipment – Containment, Overfill Protection, Testing and Inspections

Map ID	Unit No.	Transformer (kVA)	Serial Number	Type of Container	Volume of Oil (Gallons)	Type of Oil	Type of Secondary Containment/ Drainage Control	Overfill Protection and Testing & Inspections
33	H-60	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
34	H-62	1,000	GM2056582	(1, 2)	480	Mineral Oil	(3)	(4, 5)
35	H-63	1,000	GM2056581	(1, 2)	460	Mineral Oil	(3)	(4, 5)
36	H-64	1,000	G131290	(1, 2)	453	Mineral Oil	(3)	(4, 5)
37	H-65	1,000	GM277550	(1, 2)	230	Mineral Oil	(3)	(4, 5)
38	H-67	1,000	85530	(1, 2)	340	Mineral Oil	(3)	(4, 5)
39	H-68	500	80V1863	(1, 2)	250	Mineral Oil	(3)	(4, 5)
40	H-70	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
41	H-72	750	920152A1	(1, 2)	345	Mineral Oil	(3)	(4, 5)
56	H-74	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
42	H-75	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
43	ISOM	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
44	J-2	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
45	K-70	1,000	2422189	(1, 2)	350	Mineral Oil	(3)	(4, 5)
46	L-1	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
47	L-2	1,000	07081617	(1, 2)	275	High MW Oil	(3)	(4, 5)
48	M-1	10,000	0526001699	(1, 2)	1,445	Mineral Oil	(3)	(4, 5)
49	M-2	750	0526001701	(1, 2)	352	Mineral Oil	(3)	(4, 5)
50	M-2	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
51	**OG&E 69 KV/ 4 16 KV Sub**	--	--	--	--	--	--	(6)
52	TR001	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
53	TR001C	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
54	TR002	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
55	West Flare	(7)	(7)	(1, 2)	(7)	(7)	(3)	(4, 5)
Total Oil-Filled Electrical Equipment Storage Capacity: 5 bbls								

Table 8 Legend

[1] Typically consists of mild welded steel reinforced with sheets to avoid oil losses.
[2] Constructed in accordance with STI standards and compatible with the material stored and the conditions of storage, i.e., pressure and temperature.
[3] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[4] Tanks are refilled by qualified private contractors using appropriate safety precautions.
[5] Quarterly visual inspections for leaks and loose connections and annual oil analysis by a qualified private contractor. Any deficiencies identified are promptly corrected.
[6] Unit is not owned by WRC and is shown for information purposes only. WRC coordinates with OG&E regarding spill prevention of this transformer. Volume not included in WRC oil storage capacity.
[7] Information not available at the time of Plan drafting.

Table 9

Oil-Filled Operating Equipment – Containment, Overfill Protection, Testing and Inspections

Location	Equipment	Type of Container	Volume of Oil (Gallons)	Type of Oil	Type of Secondary Containment/ Drainage Control	Overfill Protection and Testing & Inspections
Fire Water Unit	Diesel Day Tank DT1183	(1, 2)	300	Diesel Fuel	(3, 4)	(5, 6)
Fire Water Unit	Diesel Day Tank DT1184	(1, 2)	300	Diesel Fuel	(3, 4)	(5, 6)
Fire Water Unit	Diesel Day Tank DT1185	(1, 2)	300	Diesel Fuel	(3, 4)	(5, 6)
Total Oil-Filled Operating Equipment Storage Capacity: 21 bbls						

[1] Typically consists of a mild welded steel container.
[2] Constructed in accordance with STI standards and compatible with the material stored and the conditions of storage, i.e., pressure and temperature.
[3] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[4] Sufficiently impervious concrete building floor and walls.
[5] Oil-filled operating equipment is refilled in accordance with the procedure described in Section 8.5.3 of the Plan.
[6] Monthly visual inspections by qualified WRC personnel for any leaks or loose connections. Any deficiencies identified are promptly corrected.

Table 10

Oil-Filled Manufacturing Equipment – Containment, Leak Detection, Testing and Inspections

Equipment	Contents	Type of Container	Capacity (Bbls)[3]	Type of Secondary Containment/ Drainage Control	Leak Detection, Testing & Inspections
HF Alkylation	Intermediate oil product	(1, 2)	2,658	(4, 5, 6)	(7, 8, 9)
Hydrocracker	Intermediate oil product	(1, 2)	2,965	(4, 5, 6)	(7, 8, 9)
Rose Unit	Intermediate oil product	(1, 2)	1,977	(4, 5, 6)	(7, 8, 9)
FCCU	Intermediate oil product	(1, 2)	6,616	(4, 5, 6)	(7, 8, 9)
Crude Distillation	Intermediate oil product	(1, 2)	9,591	(4, 5, 6)	(7, 8, 9)
Naphtha Hydrotreater	Intermediate oil product	(1, 2)	839	(4, 5, 6)	(7, 8, 9)
LSR Hydrotreater	Intermediate oil product	(1, 2)	326	(4, 5, 6)	(7, 8, 9)
Platformer	Intermediate oil product	(1, 2)	1,419	(4, 5, 6)	(7, 8, 9)
Diesel Hydrotreater	Intermediate oil product	(1, 2)	1,166	(4, 5, 6)	(7, 8, 9)
Gasoline Hydrotreater	Intermediate oil product	(1, 2)	1,327	(4, 5, 6)	(7, 8, 9)
Benfree Unit	Intermediate oil product	(1, 2)	5,544	(4, 5, 6)	(7, 8, 9)
Hydrogen Plant	Hydrogen, methane, ethane, traces of LPG-weight gases	(1, 2)	NA; no oil	(4, 5, 6)	(7, 8, 9)
Total Oil-Filled Manufacturing Equipment Storage Capacity: 34,428 bbls					

[1] Petroleum processing equipment.
[2] Constructed in accordance with appropriate industry standards, i.e., STI, API or ASME, and compatible with the material stored and the conditions of storage, i.e., pressure and temperature.
[3] Oil-filled manufacturing equipment volume = (total unit volume – tank volume)*(7.48 gal/ft^3)/42 gal/bbl, using RMP unit inventories.
[4] Drainage to refinery sewer system which is capable of holding the contents of the process units and piping consisting of approximately 91,714 barrels (based on the September 24, 2003 SPCC).
[5] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[6] An oil spill contingency plan and a written commitment of manpower, equipment and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful to any navigable water or adjoining shoreline.
[7] Process operations are controlled from an explosion proof control room with pressure, temperature and flow safety devices including audio and visual alarms and automatic shut downs.
[8] Safety devices are tested regularly to ensure proper operation.
[9] Daily visual inspections by qualified WRC personnel for any leaks or loose connections. Inspections by qualified contractor personnel during unit turnarounds. Any deficiencies identified are promptly corrected.

Table 11

Loading and Unloading Areas/Racks - Containment, Delivery Procedures and Inspections

Area/Rack	Contents	Type of Secondary Containment, Delivery Procedures and Inspections
LUA – 1 Tank Truck Unloading Area	Ethanol	(1, 2, 4, 5, 9, 10)
LUR – 2 Tank Truck Loading Rack	Unleaded Gasoline/Diesel	(1, 2, 3, 4, 5, 9, 10)
LUA – 3 Tank Truck Loading Area (LACT Unit Area)	Crude Oil	(1, 5, 9, 10, 11)
LUR – 4 Railcar Loading Rack	LPG	(8, 9, 10)
LUR – 5 Railcar Loading Rack	Sulfur	(8, 9, 10)
LUA – 6 Tank Truck Loading Area	LPG	(8, 9, 10)
LUA – 7 Tank Truck Loading Area	Gas Oil	(2, 4, 5, 3, 9, 10)
LUR – 8 Railcar Loading Rack	Asphalt, Kerosene	(2, 3, 4, 9, 10)
LUR – 9 Tank Truck Loading Rack	Asphalt	(2, 7, 9, 10)
LUR – 10 Tank Truck Loading Rack	JP-8	(1, 2, 4, 9, 10)
LUA – 11 Tank Truck Unloading Area	Crude Oil	(1, 5, 9, 10, 11)

[1] A sufficiently impervious floor and berm capable of containing the oil until the time at which cleanup occurs (Table 20 of Appendix H).
[2] Sloped drainage to an open sump and then to an in-ground oil/water separator.
[3] Sloped drainage to an open sump and then diversion to the refinery wastewater treatment system.
[4] Sized containment for the single largest compartment of any tank truck or railcar handled at this location.
[5] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[6] Exempt pursuant to 40 C.F.R. 112.1(b).
[7] Exempt pursuant to 40 C.F.R. 112.1(d)(8).
[8] Exempt pursuant to 67 FR 47076 dated July 17, 2002.
[9] Periodic visual inspections by qualified WRC personnel for any leaks or loose connections. Any deficiencies identified are promptly corrected.
[10] WRC and LACT Unit Area delivery procedures are shown in Appendix I.
[11] Containment for unloading hose connections.

Table 12
Piping – Containment, Leak Detection, Testing and Inspections

Type of Piping	Fabrication	Secondary Containment, Leak Detection, Testing and Inspections
Transfer piping to and from bulk storage containers, both aboveground and buried	(1)	(3, 4, 6, 7, 8, 9, 12)
Intra-facility gathering line	(1)	(3, 4, 6, 7, 8, 9, 11, 12)
Transfer piping from API separators to tank no. 2007	(2)	(2, 3, 4, 6, 7, 8, 9, 12)
Transfer piping associated with manufacturing equipment, both aboveground and buried	(1)	(3, 4, 6, 7, 8, 9, 10, 12)
Piping associated with oil-filled operational equipment	(1)	(3, 4, 6, 7, 8, 9, 12)
Out-of-service pipelines	(1)	(5, 12)

[1] Single steel wall pipe constructed in accordance with ASME B31.3 standards and compatible with the material processed and the conditions of processing, i.e., pressure and temperature.

[2] Double steel wall pipe constructed in accordance with ASME B31.3 standards and compatible with the material processed and the conditions of processing, i.e., pressure and temperature.

[3] Aboveground valves and piping are visually examined monthly by qualified WRC personnel for the general conditions of items such as: flange joints, valve glands and bodies, drip/catch pans, pipe supports, bleeder and gauge valves, valve locks/seals, expansion joints and metal surfaces. Any deficiencies identified are promptly corrected.

[4] Pipe supports are designed to minimize abrasion and corrosion and allow for expansion and contraction. Insulated lines are typically equipped with guide shores to permit expansion while un-insulated lines are bare against supports. Pipe supports are visually inspected monthly by qualified WRC personnel. Any deficiencies identified are promptly corrected.

[5] Pipelines that are out-of-service or pipelines or placed on standby service for an extended time are capped or blind-flanged at the terminal connection and marked as to the origin.

[6] All buried piping that is installed or replaced after 8-16-02 must have protective coating and wrapping and cathodic protection.

[7] When a section of buried line is exposed, it is carefully examined for deterioration by a qualified piping inspector in accordance with API-570 and API-RP-1110 inspection standards. If corrosion is found, additional examination and corrective action must be taken as deemed appropriate considering the magnitude of the damage.

[8] Conduct integrity and leak testing of buried piping at the time of installation, modification, construction, relocation, or replacement by a qualified piping inspector. Piping is to be inspected at a maximum of 10 year intervals.

[9] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.

[10] Drainage to refinery sewer system which is capable of holding the contents of the process units and piping consisting of approximately 91,714 barrels (based on the September 24, 2003 SPCC).

[11] An oil spill contingency plan and a written commitment of manpower, equipment and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful to any navigable water or adjoining shoreline.

[12] WRC has approximately 140 groundwater monitoring wells located around the refinery for groundwater monitoring, remediation, and hydrocarbon recovery. The remediation and monitoring program is overseen by the Land Protection Division of the Oklahoma Department of Environmental Quality. Any deficiencies identified are promptly corrected.

Appendix G

Potential Volume Release, Discharge Rate, Direction of Flow, and Secondary Containment

Table 13

Material Storage Areas - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (Bbls)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
MSA – 1				
Failure of aboveground tank	2,143	Gradual to instantaneous	Atmosphere	(9)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 2				
Failure of aboveground tank	80,000	Gradual to instantaneous	(2)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 3				
Failure of aboveground tank	100,000	Gradual to instantaneous	(2)	(6)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 4				
Failure of aboveground tank	20,000	Gradual to instantaneous	(2)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 5				
Failure of aboveground tank	5,100	Gradual to instantaneous	(2)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		

Table 13 (Cont'd)

Material Storage Areas - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (Bbls)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
MSA – 6				
Failure of aboveground tank	79,600	Gradual to instantaneous	(2)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 7				
Failure of aboveground tank	250,000	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 8				
Failure of aboveground tank	2,400	Gradual to instantaneous	Atmosphere	(9)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 9				
Failure of aboveground tank	24,800	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 10				
Failure of aboveground tank	40,000	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 11				
Failure of aboveground tank	10,000	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		

Table 13 (Cont'd)

Material Storage Areas - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (Bbls)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
MSA – 12				
Failure of aboveground tank	15,000	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 13				
Failure of aboveground tank	5,100	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 14				
Failure of aboveground tank	80,456	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 15				
Failure of aboveground tank	64,000	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 16				
Failure of aboveground tank	26,800	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 17				
Failure of aboveground tank	76,425	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		

Table 13 (Cont'd)

Material Storage Areas - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (Bbls)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
MSA – 18				
Failure of aboveground tank	86,000	Gradual to instantaneous	(1)	(5)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 19				
Failure of aboveground tank	54,356	Gradual to instantaneous	(1)	(5)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 20				
Failure of aboveground tank	80,000	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 21				
Failure of aboveground tank	80,000	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 22				
Failure of aboveground tank	35,700	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 23				
Failure of aboveground tank	80,000	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		

Table 13 (Cont'd)

Material Storage Areas - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (Bbls)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
MSA – 24				
Failure of aboveground tank	150,000	Gradual to instantaneous	(2)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		
MSA – 25				
Failure of aboveground tank	250,000	Gradual to instantaneous	(1)	(4, 5,10)
Tank overfill	1 to 120	10 gal/min		
Pipe failure	1 to 50	5 gal/min		
Leaking pipe	1 to 10	1 gal/min		

[1] Direction of flow is SW to the unnamed tributary to Turkey Sandy Creek.
[2] Direction of flow is SW to West Sandy Creek.
[3] Direction of flow is SW to the Washita River.
[4] A sufficiently impervious floor and berm which is capable of containing the oil until the time at which cleanup occurs (Table 20 of Appendix H).
[5] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[6] Exempt pursuant to 40 C.F.R. 112.1(b).
[7] Exempt pursuant to 40 C.F.R. 112.1(d)(6).
[8] Exempt pursuant to 40 C.F.R. 112.1(d)(8).
[9] Exempt pursuant to 67 FR 47076 dated July 17, 2002.
[10] Sufficient freeboard as determined in Table 22 of Appendix L.

Table 14

Portable Material Storage Areas - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (Bbls)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
PMSA - 1				
Failure of portable tank	2,000	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 2				
Failure of portable tank	564	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 3				
Failure of portable tank	8,000	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 4				
Failure of portable tank	170	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 5[4]				
Failure of tank	400	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 6[4]				
Failure of tank	400	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 7				
Failure of portable tank	6,428	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		

Table 14 (Cont'd)

Portable Material Storage Areas - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (Bbls)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
PMSA – 8				
Failure of portable tank	1,321	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 9				
Failure of portable tank	3,171	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 10				
Failure of portable tank	2,000	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA - 11				
Failure of portable tank	1,000	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 12				
Failure of portable tank	5,600	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 13				
Failure of portable tank	765	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 14				
Failure of portable tank	21,000	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		
PMSA – 15				
Failure of portable tank	2,325	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		

Table 14 (Cont'd)

Portable Material Storage Areas - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (Bbls)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
PMSA - 16				
Failure of portable tank	560	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 5	1 gal/min		
Leaking tank	1 to 5	1 gal/min		

[1] Direction of flow is SW to the unnamed tributary to Turkey Sandy Creek.
[2] Direction of flow is SW to West Sandy Creek.
[3] Land-based spill response kits/equipment which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[4] LACT tanks owned by others who have their own SPCC plans. Info here for information purposes only. The 400-bbl LACT tanks are not installed as portable tanks.

Table 15
Oil-Filled Electrical Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Unit No. 26-XF-01				
Failure of tank	476	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. 26-XF-02				
Failure of tank	455	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. 40-EBXFR-01				
Failure of tank	(4)	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. 40-XFR-001				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. 40-XFRJ2-1				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. 40-XFRJ2-2				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. 90-CC15XFR				
Failure of tank	(4)	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. 90-XFR-002				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		

Table 15 (Cont'd)

Oil-Filled Electrical Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Unit No. 90-XFR-003				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. 90-XFR-004				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. 90-XFR-005				
Failure of tank	(4)	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. A-30				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. A-31				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. A-37				
Failure of tank	223	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. B-8				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		

Table 15 (Cont'd)

Oil-Filled Electrical Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Unit No. C-4				
Failure of tank	419	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. C-5				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. D-37				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. D-42				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. D-44				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. D-48				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. D-52				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. D-53				
Failure of tank	258	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		

Table 15 (Cont'd)

Oil-Filled Electrical Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Unit No. D-54				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. E-21				
Failure of tank	308	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. E-23				
Failure of tank	328	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. E-25				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. G-90				
Failure of tank	375	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-33				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-51				
Failure of tank	453	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		

Table 15 (Cont'd)

Oil-Filled Electrical Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Unit No. H-52				
Failure of tank	453	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-53				
Failure of tank	354	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-60				
Failure of tank	(4)	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-62				
Failure of tank	480	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-63				
Failure of tank	460	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-64				
Failure of tank	453	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-65				
Failure of tank	230	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		

Table 15 (Cont'd)

Oil-Filled Electrical Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Unit No. H-67				
Failure of tank	340	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-68				
Failure of tank	250	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-70				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-72				
Failure of tank	345	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-74				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. H-75				
Failure of tank	(4)	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. ISOM				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		

Table 15 (Cont'd)

Oil-Filled Electrical Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Unit No. J-2				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. K-70				
Failure of tank	350	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. L-1				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. L-2				
Failure of tank	275	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. M-1				
Failure of tank	1,445	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. M-2				
Failure of tank	352	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. OG&E				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. TR001				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		

Table 15 (Cont'd)

Oil-Filled Electrical Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Unit No. TR001C				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. TR002				
Failure of tank	(4)	Gradual to instantaneous	(1)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		
Unit No. West Flare				
Failure of tank	(4)	Gradual to instantaneous	(2)	(3)
Tank overfill	1 to 2	1 gal/min		
Leaking tank	1 to 2	1 gal/min		

[1] Direction of flow is SW to the unnamed tributary to Turkey Sandy Creek.
[2] Direction of flow is SW to West Sandy Creek.
[3] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[4] Information not available at the time of Plan drafting.

Table 16

Oil-Filled Operating Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (Gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Diesel Day Tank Nos. DT1183, DT1184 and DT1185				
Failure of tank	300	Gradual to instantaneous	(1)	(2, 3)
Tank overfill	0 to 1	1 gal/min		
Pipe failure	0 to 1	1 gal/min		

[1] Direction of flow is SW to West Sandy Creek.
[2] Sufficiently impervious concrete building floor and walls.
[3] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.

Table 17

Oil-Filled Manufacturing Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment[1]

Potential Event	Maximum Volume Released (Bbls)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
HF Alkylation				
Failure of process vessel (Depropanizer Tower)	1,494	Gradual to instantaneous	(2)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		
Hydrorcracker				
Failure of process vessel (Main Fractionator)	1,289	Gradual to instantaneous	(3)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		
Rose Unit				
Failure of process vessel (Solvent Surge Drum)	463	Gradual to instantaneous	(3)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		
FCCU				
Failure of process vessel (Main Column)	874	Gradual to instantaneous	(3)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		
Crude Distillation				
Failure of process vessel (Stripper Column)	1,903	Gradual to instantaneous	(3)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		

Table 17 (Cont'd)

Oil-Filled Manufacturing Equipment - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (Bbls)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Naptha Hydrotreater				
Failure of process vessel (Naphtha Stripper Column)	567	Gradual to instantaneous	(3)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		
LSR Hydrotreater				
Failure of process vessel (LSR Stabilizer)	142	Gradual to instantaneous	(3)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		
Platformer				
Failure of process vessel (Plat Stabilizer)	280	Gradual to instantaneous	(3)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		
Diesel Hydrotreater				
Failure of process vessel (Hot Separator Feed)	137	Gradual to instantaneous	(3)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		
Gasoline Hydrotreater				
Failure of process vessel (HDS Reactor)	331	Gradual to instantaneous	(3)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		
Benfree Unit				
Failure of process vessel (Benzene Reactor)	32	Gradual to instantaneous	(3)	(4, 5, 6)
Pipe failure	100 to 200	20 gal/min		
Leaking pipe	1 to 5	1 gal/min		
Hydrogen Plant				
No liquids in process	NA	NA	(3)	(4, 5, 6)

Table 17 Legend

[1] WRC Risk Management Plan Documentation
[2] Direction of flow is SW to West Sandy Creek.
[3] Direction of flow is SW to the unnamed tributary to Turkey Sandy Creek.
[4] Drainage to refinery sewer system which is capable of holding the contents of the process units and piping consisting of approximately 91,714 barrels (based on the September 24, 2003 SPCC).
[5] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[6] An oil spill contingency plan and a written commitment of manpower, equipment and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful to any navigable water or adjoining shoreline.

Table 18
Loading and Unloading Areas/Racks - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
LUA – 1				
Tank truck leak	1 to 6,000	Gradual to instantaneous	(1)	(3)
Tank truck leak or failure outside the berm	1 to 10	1 gal/min		
Hose leak during truck loading	1 to 5	1 gal/min		
LUR – 2				
Tank truck leak	1 to 6,000	Gradual to instantaneous	(1)	(3)
Tank truck leak or failure outside the berm	1 to 10	1 gal/min		
Hose leak during truck loading	1 to 5	1 gal/min		
LUA – 3				
Tank truck leak	1 to 6,000	Gradual to instantaneous	(1)	(3)
Tank truck leak or failure outside the berm	1 to 10	1 gal/min		
Hose leak during truck loading	1 to 5	1 gal/min		
LUR – 4				
Railcar leak	1 to 30,000	Gradual to instantaneous	(2)	(3)
Railcar leak or failure outside the berm	1 to 10	10 gal/min		
Hose leak during railcar loading	1 to 5	1 gal/min		
LUR – 5				
Railcar leak	1 to 30,000	Gradual to instantaneous	(2)	(3)
Railcar leak or failure outside the berm	1 to 10	10 gal/min		
Hose leak during truck loading	1 to 5	1 gal/min		
LUA – 6				
Tank truck leak	1 to 6,000	Gradual to instantaneous	(2)	(3)
Tank truck leak or failure outside the berm	1 to 10	1 gal/min		
Hose leak during truck loading	1 to 5	1 gal/min		

Table 18 (Cont'd)
Loading and Unloading Areas/Racks - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
LUA – 7				
Tank truck leak	1 to 6,000	Gradual to instantaneous	(1)	(3)
Tank truck leak or failure outside the berm	1 to 10	1 gal/min		
Hose leak during truck loading	1 to 5	1 gal/min		
LUR – 8				
Railcar leak	1 to 30,000	Gradual to instantaneous	(1)	(3)
Railcar leak or failure outside the berm	1 to 10	10 gal/min		
Hose leak during truck loading	1 to 5	1 gal/min		
LUR – 9				
Tank truck leak	1 to 6,000	Gradual to instantaneous	(1)	(3)
Tank truck leak or failure outside the berm	1 to 10	1 gal/min		
Hose leak during truck loading	1 to 5	1 gal/min		
LUR – 10				
Tank truck leak	1 to 6,000	Gradual to instantaneous	(2)	(3)
Tank truck leak or failure outside the berm	1 to 10	1 gal/min		
Hose leak during railcar loading	1 to 5	1 gal/min		
LUR – 11				
Tank truck leak	1 to 6,000	Gradual to instantaneous	(2)	(3)
Tank truck leak or failure outside the berm	1 to 10	1 gal/min		
Hose leak during railcar loading	1 to 5	1 gal/min		

Table 18 Legend
[1] Direction of flow is SW to West Sandy Creek.
[2] Direction of flow is SW to the unnamed tributary to Turkey Sandy Creek.
[3] Table 11 of Appendix F.

Table 19

Piping - Potential Volume Released, Discharge Rate, Direction of Flow, and Secondary Containment

Potential Event	Maximum Volume Released (gallons)	Maximum Discharge Rate	Direction of Flow	Secondary Containment
Transfer Piping to and from Bulk Storage Containers, both Aboveground and Buried				
Pipe Failure	1 to 50	5 gal/min	(1)	(2)
Leaking Pipe	1 to 10	1 gal/min	(1)	(2)
Intra-facility gathering line				
Pipe Failure	1 to 50	5 gal/min	(1)	(2, 4)
Leaking Pipe	1 to 10	1 gal/min	(1)	(2, 4)
Transfer piping form API separators to tank no. 2007				
Pipe Failure	1 to 50	5 gal/min	(1)	(5)
Leaking Pipe	1 to 10	1 gal/min	(1)	(5)
Transfer Piping Associated with Manufacturing Equipment, both Aboveground and Buried				
Pipe Failure	1 to 50	5 gal/min	(1)	(2, 3, 4)
Leaking Pipe	1 to 10	1 gal/min	(1)	(2, 3, 4)
Piping associated with Oil-Filled Operational Equipment				
Pipe Failure	1 to 50	5 gal/min	(1)	(2)
Leaking Pipe	1 to 10	1 gal/min	(1)	(2)
Out-of-Service Pipelines				
Pipe Failure	1 to 50	5 gal/min	(1)	--
Leaking Pipe	1 to 10	1 gal/min	(1)	--

[1] Direction of flow is west to southwest beneath the site.
[2] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[3] Drainage to refinery sewer system which is capable of holding the contents of the process units and piping consisting of approximately 91,714 barrels (based on the September 24, 2003 SPCC).
[4] An oil spill contingency plan and a written commitment of manpower, equipment and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful to any navigable water or adjoining shoreline.
[5] Double steel wall pipe constructed in accordance with ASME B31.3 standards and compatible with the material processed and the conditions of processing, i.e., pressure and temperature.

Appendix H

Sufficiently Impervious Determination

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for
Garvin County, Oklahoma, and Murray County, Oklahoma

Wynnewood Refining Company, LLC

January 13, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

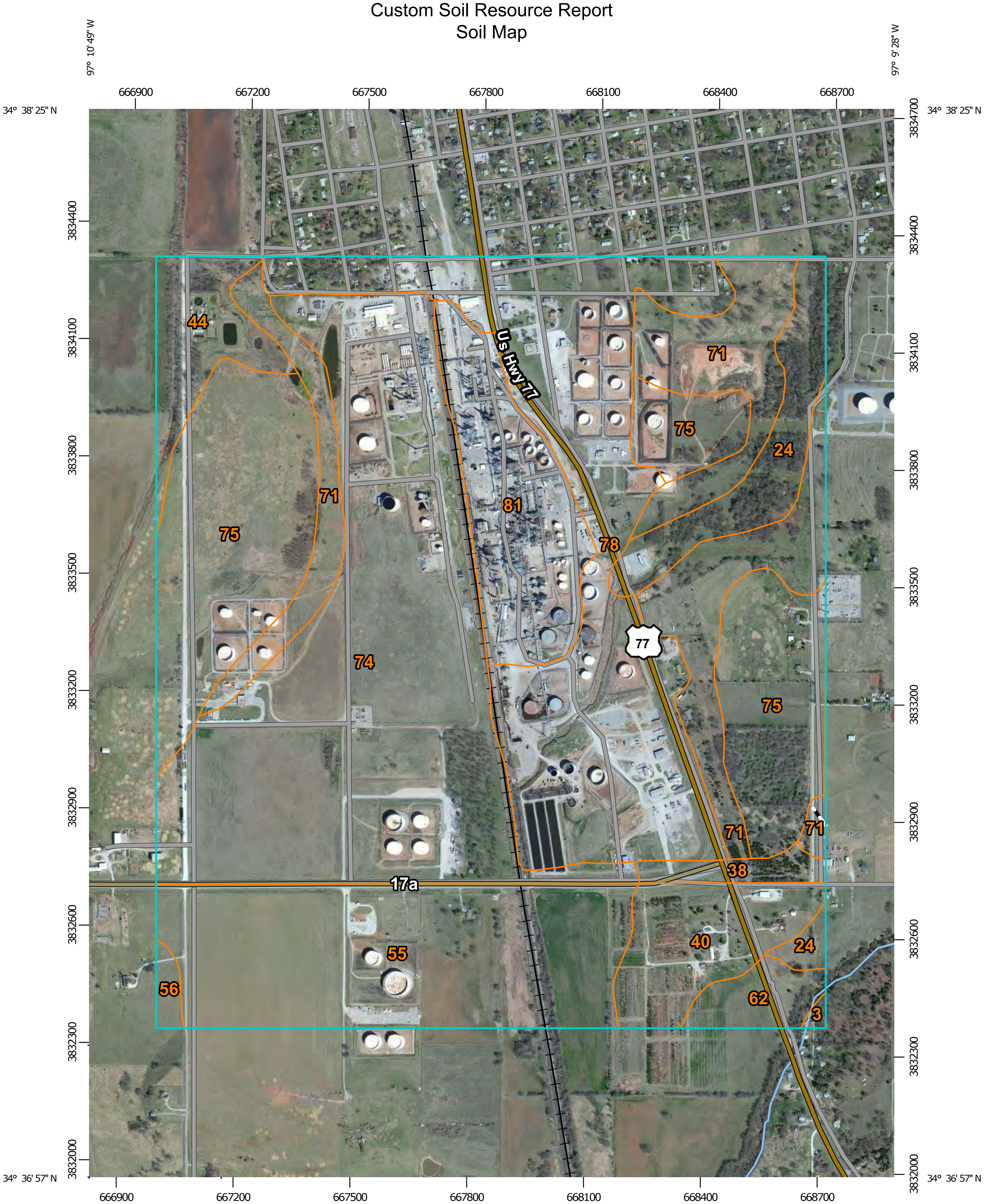
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map



Map Scale: 1:13,300 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 150, 300, 600, 900

Feet: 0, 500, 1000, 2000, 3000

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Garvin County, Oklahoma
Survey Area Data: Version 9, Dec 8, 2009

Soil Survey Area: Murray County, Oklahoma
Survey Area Data: Version 8, Dec 10, 2009

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 28, 2011—May 7, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Garvin County, Oklahoma (OK049)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
24	Garvin and Elandco soils, 0 to 1 percent slopes, frequently flooded	28.0	3.3%
38	Konawa fine sandy loam, 1 to 3 percent slopes	7.7	0.9%
44	Lela clay, 0 to 1 percent slopes, rarely flooded	24.5	2.9%
71	Teller fine sandy loam, 3 to 5 percent slopes, eroded	92.5	11.0%
74	Teller loam, 0 to 1 percent slopes	202.2	24.0%
75	Teller loam, 1 to 3 percent slopes	127.9	15.2%
78	Teller-Urban land complex, 0 to 5 percent slopes	149.7	17.8%
81	Urban land	51.3	6.1%
Subtotals for Soil Survey Area		**683.8**	**81.3%**
Totals for Area of Interest		**841.5**	**100.0%**

Murray County, Oklahoma (OK099)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
3	Bastrop loam, 1 to 5 percent slopes, eroded	0.8	0.1%
24	Elandco silt loam, 0 to 1 percent slopes, occasionally flooded	3.2	0.4%
40	Konawa fine sandy loam, 0 to 3 percent slopes	32.1	3.8%
55	Teller loam, 0 to 1 percent slopes	106.9	12.7%
56	Teller loam, 1 to 3 percent slopes	3.1	0.4%
62	Watonga silty clay loam, 0 to 1 percent slopes, rarely flooded	11.5	1.4%
Subtotals for Soil Survey Area		**157.7**	**18.7%**
Totals for Area of Interest		**841.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Garvin County, Oklahoma

24—Garvin and Elandco soils, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

Elevation: 200 to 1,500 feet
Mean annual precipitation: 23 to 42 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 185 to 290 days

Map Unit Composition

Garvin and similar soils: 55 percent
Elandco and similar soils: 30 percent
Minor components: 15 percent

Description of Garvin

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loamy and/or clayey alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water capacity: High (about 10.0 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 5w
Hydrologic Soil Group: D
Ecological site: Heavy bottomland PE 56-66 (R085XY045OK)

Typical profile

0 to 10 inches: Silty clay
10 to 30 inches: Clay
30 to 44 inches: Clay
44 to 80 inches: Clay

Description of Elandco

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 11.4 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 5w
Hydrologic Soil Group: B
Ecological site: Loamy bottomland PE 56-66 (R085XY050OK)

Typical profile

0 to 15 inches: Silt loam
15 to 35 inches: Silty clay loam
35 to 62 inches: Silty clay loam

Minor Components

Port

Percent of map unit: 7 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy Bottomland PE 44-64 (R080AY050OK)

Bergstrom

Percent of map unit: 7 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy bottomland PE 56-66 (R085XY050OK)

Harjo

Percent of map unit: 1 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Meadow PE 44-64 (R080AY090OK)

38—Konawa fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

Elevation: 500 to 1,500 feet
Mean annual precipitation: 26 to 45 inches
Mean annual air temperature: 58 to 64 degrees F
Frost-free period: 200 to 230 days

Map Unit Composition

Konawa and similar soils: 80 percent
Minor components: 20 percent

Description of Konawa

Setting

Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy and sandy alluvium

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.6 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: Sandy Savannah PE 48 - 64 (R084AY075OK)

Typical profile

0 to 8 inches: Fine sandy loam
8 to 12 inches: Fine sandy loam
12 to 34 inches: Sandy clay loam
34 to 62 inches: Sandy clay loam
62 to 72 inches: Fine sandy loam

Minor Components

Teller

Percent of map unit: 10 percent

Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy Prairie PE 44-64 (R080AY073OK)

Konsil

Percent of map unit: 9 percent
Landform: Hillslopes on hills
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Deep sand savannah PE 44-64 (R084BY018OK)

Bocox

Percent of map unit: 1 percent
Landform: Depressions on interdunes
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Meadow PE 44-64 (R080AY090OK)

44—Lela clay, 0 to 1 percent slopes, rarely flooded

Map Unit Setting

Elevation: 700 to 1,500 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 190 to 230 days

Map Unit Composition

Lela and similar soils: 80 percent
Minor components: 20 percent

Description of Lela

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent

Available water capacity: Moderate (about 7.7 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 3s
Hydrologic Soil Group: D
Ecological site: Clayey Bottomland PE 44-64 (R080AY045OK)

Typical profile

0 to 24 inches: Clay
24 to 42 inches: Clay
42 to 72 inches: Clay

Minor Components

Mclain

Percent of map unit: 10 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy Bottomland PE 44-64 (R080AY050OK)

Asher

Percent of map unit: 9 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy Bottomland PE 44-64 (R080AY050OK)

Lebron

Percent of map unit: 1 percent
Landform: Depressions on flood plains
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Meadow PE 44-64 (R080AY090OK)

71—Teller fine sandy loam, 3 to 5 percent slopes, eroded

Map Unit Setting

Elevation: 800 to 1,300 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 230 days

Map Unit Composition

Teller, eroded, and similar soils: 90 percent
Minor components: 10 percent

Description of Teller, Eroded

Setting

Landform: Paleoterraces

Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.1 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Eroded Loamy Prairie PE 44-64 (R080AY856OK)

Typical profile

0 to 5 inches: Fine sandy loam
5 to 50 inches: Sandy clay loam
50 to 64 inches: Fine sandy loam

Minor Components

Norge, eroded

Percent of map unit: 10 percent
Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Eroded Loamy Prairie PE 44-64 (R080AY856OK)

74—Teller loam, 0 to 1 percent slopes

Map Unit Setting

Elevation: 700 to 1,300 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 230 days

Map Unit Composition

Teller and similar soils: 90 percent
Minor components: 10 percent

Description of Teller

Setting

Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.7 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: Loamy Prairie PE 44-64 (R080AY056OK)

Typical profile

0 to 12 inches: Loam
12 to 18 inches: Loam
18 to 40 inches: Clay loam
40 to 60 inches: Fine sandy loam
60 to 75 inches: Fine sandy loam

Minor Components

Vanoss

Percent of map unit: 5 percent
Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy Prairie PE 44-64 (R080AY056OK)

Norge

Percent of map unit: 5 percent
Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Loamy Prairie PE 44-64 (R080AY056OK)

75—Teller loam, 1 to 3 percent slopes

Map Unit Setting

Elevation: 800 to 1,300 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 230 days

Map Unit Composition

Teller and similar soils: 95 percent
Minor components: 5 percent

Description of Teller

Setting

Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.5 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: Loamy Prairie PE 44-64 (R080AY056OK)

Typical profile

0 to 12 inches: Loam
12 to 56 inches: Sandy clay loam
56 to 66 inches: Fine sandy loam

Minor Components

Norge

Percent of map unit: 5 percent
Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex

Across-slope shape: Linear
Ecological site: Loamy Prairie PE 44-64 (R080AY056OK)

78—Teller-Urban land complex, 0 to 5 percent slopes

Map Unit Setting

Elevation: 700 to 2,000 feet
Mean annual precipitation: 22 to 40 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 185 to 230 days

Map Unit Composition

Teller and similar soils: 50 percent
Urban land: 30 percent
Minor components: 20 percent

Description of Teller

Setting

Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.7 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 3e
Hydrologic Soil Group: B

Typical profile

0 to 8 inches: Loam
8 to 16 inches: Loam
16 to 40 inches: Sandy clay loam
40 to 52 inches: Fine sandy loam
52 to 70 inches: Fine sandy loam

Description of Urban Land

Setting

Parent material: Loamy mine spoil or earthy fill

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 8
Hydrologic Soil Group: D

Typical profile

0 to 60 inches: Variable

Minor Components

Vanoss

Percent of map unit: 10 percent
Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy Prairie PE 44-64 (R080AY056OK)

Norge

Percent of map unit: 10 percent
Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Loamy Prairie PE 44-64 (R080AY056OK)

81—Urban land

Map Unit Setting

Elevation: 700 to 2,000 feet
Mean annual precipitation: 22 to 40 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 185 to 230 days

Map Unit Composition

Urban land: 100 percent

Description of Urban Land

Setting

Parent material: Mine spoil or earthy fill

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 8

Hydrologic Soil Group: D

Typical profile

0 to 60 inches: Variable

Murray County, Oklahoma

3—Bastrop loam, 1 to 5 percent slopes, eroded

Map Unit Setting

Elevation: 400 to 1,200 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 64 to 70 degrees F
Frost-free period: 220 to 270 days

Map Unit Composition

Bastrop, eroded, and similar soils: 100 percent

Description of Bastrop, Eroded

Setting

Landform: Stream terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 9.0 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Eroded Sandy Savannah PE 44-64 (R084BY876OK)

Typical profile

0 to 7 inches: Loam
7 to 27 inches: Sandy clay loam
27 to 49 inches: Clay loam
49 to 80 inches: Sandy clay loam

24—Elandco silt loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Setting

Elevation: 970 to 1,500 feet

Mean annual precipitation: 23 to 40 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 190 to 240 days

Map Unit Composition

Elandco and similar soils: 100 percent

Description of Elandco

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 11.4 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: Loamy bottomland PE 56-66 (R085XY050OK)

Typical profile

0 to 21 inches: Silt loam
21 to 58 inches: Silty clay loam
58 to 80 inches: Silty clay loam

40—Konawa fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 500 to 1,500 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 58 to 64 degrees F
Frost-free period: 200 to 230 days

Map Unit Composition

Konawa and similar soils: 100 percent

Description of Konawa

Setting

Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy and sandy alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 9.2 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: Sandy Savannah PE 48 - 64 (R084AY075OK)

Typical profile

0 to 8 inches: Fine sandy loam
8 to 16 inches: Fine sandy loam
16 to 64 inches: Sandy clay loam
64 to 80 inches: Fine sandy loam

55—Teller loam, 0 to 1 percent slopes

Map Unit Setting

Elevation: 400 to 1,500 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 58 to 70 degrees F
Frost-free period: 200 to 270 days

Map Unit Composition

Teller and similar soils: 90 percent
Minor components: 10 percent

Description of Teller

Setting

Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.8 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: Loamy Prairie PE 44-64 (R080AY056OK)

Typical profile

0 to 11 inches: Loam
11 to 22 inches: Loam
22 to 56 inches: Sandy clay loam
56 to 80 inches: Fine sandy loam

Minor Components

Konawa

Percent of map unit: 5 percent
Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Deep Sand Savannah PE 48-64 (R084AY018OK)

Bastrop

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy savannah PE 44-64 (R084BY076OK)

56—Teller loam, 1 to 3 percent slopes

Map Unit Setting

Elevation: 400 to 1,500 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 58 to 70 degrees F
Frost-free period: 200 to 270 days

Map Unit Composition

Teller and similar soils: 90 percent
Minor components: 10 percent

Description of Teller

Setting

Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 10.8 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: Loamy Prairie PE 44-64 (R080AY056OK)

Typical profile

0 to 10 inches: Loam
10 to 22 inches: Loam
22 to 55 inches: Sandy clay loam
55 to 80 inches: Fine sandy loam

Minor Components

Bastrop

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy savannah PE 44-64 (R084BY076OK)

Konawa

Percent of map unit: 5 percent
Landform: Paleoterraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Sandy Savannah PE 48 - 64 (R084AY075OK)

62—Watonga silty clay loam, 0 to 1 percent slopes, rarely flooded

Map Unit Setting

Elevation: 800 to 1,300 feet
Mean annual precipitation: 26 to 40 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 220 days

Map Unit Composition

Watonga and similar soils: 100 percent

Description of Watonga

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous clayey alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 10.1 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability (nonirrigated): 2s
Hydrologic Soil Group: D
Ecological site: Clayey Bottomland PE 44-64 (R080AY045OK)

Typical profile

0 to 18 inches: Silty clay loam
18 to 46 inches: Silty clay
46 to 80 inches: Silty clay

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://soils.usda.gov/

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://soils.usda.gov/

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://soils.usda.gov/

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.glti.nrcs.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://soils.usda.gov/

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

Table 20

Sufficiently Impervious Determination

Material Storage Area	Contents	Soil Permeability, in/hr [2]	Secondary Containment System			Sufficiently Impervious?	
			Design		Implementation/Maintenance	No	Yes
			Floor	Berm			
MSA-1	(1)	0.6 – 2.0	(7)	(7)	--	--	--
MSA-2			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-3			(5)	(5)	--	--	--
MSA-4			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-5			Concrete Slab	Concrete Slab	(3, 4)	--	Yes
MSA-6			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-7			Native Soil	Native Soil	(3, 4)	--	Yes
MSA-8			(7)	(7)	--	--	--
MSA-9			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-10			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-11			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-12			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-13			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-14			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-15			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-16			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-17			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-18			(6)	(6)	--	--	--
MSA-19			(6)	(6)	(3, 4)	--	Yes
MSA-20			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-21			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-22			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-23			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-24			Native Soil	Native Soil/Asphalt	(3, 4)	--	Yes
MSA-25			Native Soil	Native Soil	(3, 4)	--	Yes

Table 20 Legend

[1] Table 6 of Appendix F.
[2] Natural Resources Conservation Service Soil Report for Garvin County and Murray County, Oklahoma (Appendix I).
[3] Floor and berms are inspected periodically and following rain events for exterior seeps. Any deficiencies identified are promptly corrected.
[4] Land-based spill response kits which are available in both quantity and location to prevent the discharge of oil in harmful quantities to navigable waters or adjoining shorelines.
[5] Exempt pursuant to 40 C.F.R. 112.1(b).
[6] Exempt pursuant to 40 C.F.R. 112.1(d)(6).
[7] Exempt pursuant to 67 FR 47076 dated July 17, 2002.

Appendix I

Loading/Unloading Procedures

Attachment 1

Ethanol Unloading Operations

1.0 PURPOSE:

This procedure provides safe and consistent instructions to Ethanol Unloading Operations.

2.0 PREREQUISITES:

- None

3.0 SPECIAL CONSIDERATIONS OR PRECAUTIONS:

- Standard Personal Protective Equipment (PPE) shall be donned before performance of this Procedure
- Any additional PPE as identified in SDS or in this procedure shall be donned before performing this procedure
- See Unit Operation Manual for the Safety Systems and their Functions
- Process or waste streams cannot bypass air emission control device. Bypassing to the flare is permissible as an emergency air emission control device, but flaring of streams containing H_2S or sulfides shall be minimized
- Chemicals in any process may cause severe burns to eyes, skin and all body tissue. Eye damage may be permanent. In case of contact, immediately flush skin or eyes with abundant amount of water for at least 15 to 20 minutes while removing contaminated clothing. After required flush of affected area seek immediate medical attention
- In the event of a spill to ground, to the refinery sewer, or the storm water ditch, and/or in the event of a release to the atmosphere above allowable limits, immediately notify your Zone Supervisor and the Environmental Department. Determine cause of the situation and take immediate steps to correct it

4.0 REQUIRED EQUIPMENT:

- N/A.

5.0 REFERENCES:

- P&ID
- Wynnewood Safety Policies
- Operating Manual

6.0 PROCEDURE: Startup Ethanol for Unloading Ethanol Trucks.

6.1 OPEN pump discharge.

6.2 OPEN pump suction.

6.3 OPEN suction valves upstream of pump suction.

6.4 ENSURE air is removed from lines.

6.5 VERIFY oil level in seal pot.

6.6 OPEN inlet to tank.

6.7 OPEN valve on unloading line from Ethanol pump at 1473TK dike.

6.8 OPEN inlet of 1473TK.

6.9 OPEN 4” gate valve to inlet line of 1473TK.

7.0 Ethanol Unloading

7.1 Driver will WEIGH in at North scales to weigh product.

7.2 Guard will ISSUE driver a gate, entry and exit remote for access to the Ethanol unloading rack.

7.3 Upon arrival at pad driver will:

- SHUTDOWN engine
- CHOCK wheels
- GROUND trailer

7.4 Driver will HOOK UP hose from trailer to pump suction.

7.5 OPEN suction valve.

7.6 OPEN butterfly valve.

7.7 START pump.

7.8 VERIFY butterfly valve is closed when changing compartments.

7.9 Once truck is unloaded SHUT OFF pump, in between compartments.

7.10 CLOSE suction valve.

7.11 DISCONNECT ground.

7.12 RETURN to weigh scale.

7.13 LEAVE gate, entry and exit remote at guard shack.

7.14 LEAVE a BOL with guard.

End of Procedure

Attachment 2

PLF-Driver Loading

1.0 PURPOSE:

This procedure provides safe and consistent instructions for Driver Loading Gasoline or Diesel Products at the Product Loading Facility (PLF).

2.0 PREREQUISITES:

None

3.0 SPECIAL CONSIDERATIONS OR PRECAUTIONS:

- Standard Personal Protective Equipment (PPE) shall be donned before performance of this Procedure
- Any additional PPE as identified in SDS or in this procedure shall be donned before performing this procedure
- Chemicals in any process may cause severe burns to eyes, skin, and all body tissue. Eye damage may be permanent. In case of contact, immediately flush skin or eyes with abundant amount of water for at least 15 to 20 minutes while removing contaminated clothing. After required flush of affected area seek immediate medical attention
- Process or waste streams cannot bypass air emission control device. Bypassing to the flare is permissible as an emergency air emission control device, but flaring of streams containing H_2S or sulfides shall be minimized
- Chemicals in any process may cause severe burns to eyes, skin and all body tissue. Eye damage may be permanent. In case of contact, immediately flush skin or eyes with abundant amount of water for at least 15 to 20 minutes while removing contaminated clothing. After required flush of affected area seek immediate medical attention
- In the event of a spill to ground, to the refinery sewer, or the storm water ditch, and/or in the event of a release to the atmosphere above allowable limits, immediately notify your Zone Supervisor and the Environmental Department. Determine cause of the situation and take immediate steps to correct it

4.0 REQUIRED EQUIPMENT:

None

5.0 REFERENCES:

- P&IDs
- Wynnewood Safety Policies
- Product Loading Facility Operating Manual

6.0 PROCEDURE: Driver Loading.

6.1 ENTER driver's ID number at gate DTN keypad.

6.2 ENTER driver's pin number.

6.3 ENTER terminal singly through south automatic gate.

NOTE

Only authorized drivers are allowed past the drivers lounge. Unauthorized personnel may go to the drivers lounge area during the loading procedure.

6.4 ENTER staging lane for one of the following desired bays:

- North staging lane for bay numbers one (1) and two (2)
- South staging lane for bay numbers two (2) and three (3)

SAFETY WARNING

DO NOT smoke or operate any spark making device inside Product Loading Facility (PLF) fence**.** Failure to comply may result in injury or death and will result in being permanently barred from the PLF.

6.5 ENTER desired bay.

6.6 SHUT OFF truck engine.

6.7 SET emergency brake.

6.8 CONNECT Scully ground system.

6.9 CONNECT vapor recovery system hose.

6.10 CONNECT loading arm to trailer.

6.11 ENTER the following driver's information into DTN keypad:

- ENTER driver's ID number
- ENTER driver's pin number
- ENTER trailer number
- ENTER customer number
- PRESS YES to confirm

6.12 ENTER the following driver's information into ACCULOAD keypad:

- SELECT product with F1
- ENTER amount
- PRESS start

NOTE

Loading rate will ramp down 50 gallons before desired amount is reached.

6.13 REMAIN within reach of Acculoads product loading STOP button

6.14 MONITOR loading during entire loading process for leaks during loading.

6.15 REPEAT steps 6.9-12 for each truck compartment.

6.16 PERFORM the following to end loading:

A. PRESS enter then choose end loading on DTN Card reader

B. PRESS YES to confirm

6.17 DISCONNECT the following:

- Loading Arms
- Vapor Recovery Hose
- Scully ground system

6.18 DRIVE to driver’s lounge building.

6.19 ENTER driver’s ID number into Signature Capturing Device to receive BOL.

6.20 ACCEPT BOL with signature and date.

6.21 EXIT through automatic gate.

End of Procedure

Attachment 3

Jet Fuel Truck Loading

1.0 PURPOSE:

This procedure provides safe and consistent instructions for Loading Trucks at JP-8 Rack.

2.0 PREREQUISITES:

None

3.0 SPECIAL CONSIDERATIONS OR PRECAUTIONS:

- Standard Personal Protective Equipment (PPE) shall be donned before performance of this Procedure
- Any additional PPE as identified in SDS or in this procedure shall be donned before performing this procedure
- See Unit Operation Manual for the Safety Systems and their Functions
- Process or waste streams cannot bypass air emission control device. Bypassing to the flare is permissible as an emergency air emission control device, but flaring of streams containing H_2S or sulfides shall be minimized
- Chemicals in any process may cause severe burns to eyes, skin and all body tissue. Eye damage may be permanent. In case of contact, immediately flush skin or eyes with abundant amount of water for at least 15 to 20 minutes while removing contaminated clothing. After required flush of affected area seek immediate medical attention
- In the event of a spill to ground, to the refinery sewer, or the storm water ditch, and/or in the event of a release to the atmosphere above allowable limits, immediately notify your Zone Supervisor and the Environmental Department. Determine cause of the situation and take immediate steps to correct it

4.0 REQUIRED EQUIPMENT:

- Full body harness while inspecting top of trailer.

5.0 REFERENCES:

- P&IDs
- Wynnewood Safety Policies
- Wynnewood Refining Company common carrier tank truck checklist

6.0 PROCEDURE: Truck Loading.

6.1 ENSURE driver performs the following:

A. OBSERVES no smoking requirement inside fenced area.

B. DRIVES less than five (5) miles per hour inside fenced area.

C. DRIVES to Loading Rack.

D. STOPS engine.

E. PLACES chock between tractor drive wheels.

F. CONNECTS ground cable.

G. OPENS fire valves.

H. REMOVES caps on loading heads.

I. CONNECTS vent hose.

J. REMAINS with truck while loading.

6.2 INSPECT compartments on top of trailer.

6.3 ENSURE top access ports are sealed with numbered seals.

6.4 DRAIN compartments into white bucket.

6.5 CONNECT loading arm.

6.6 SAMPLE truck after loading begins.

6.7 LOAD truck trailer using Accuload controller as follows:

A. PRESS F1 to change control from one product loading arms to the other (on West Bay only).

B. ENTER preset volume for compartment.

C. PRESS START.

D. REPEAT step 6.5, PRESS SET, then enter volume for compartment, and PRESS START.

E. REPEAT step 6.7-J for remaining compartments.

6.8 REPLACE caps on bottom after compartments are filled.

6.9 SEAL bottom caps with numbered seals.

6.10 COMPLETE Wynnewood Refining Company common carrier tank truck checklist.

6.11 ENSURE driver performs the following:

A. VERIFIES bottom cap seals are in place.

B. REMOVES vent hose from truck.

C. REMOVES ground cable from truck.

D. REMOVES wheel chock from between tractor wheels.

E. REMOVES truck from loading rack.

F. COMPLETES paper work BOL, end of day.

End of Procedure

Attachment 4

Truck Loading Rack Operation

1.0 PURPOSE:

This procedure provides safe and consistent instructions for Truck Loading Rack Operation.

2.0 PREREQUISITES:

None

3.0 SPECIAL CONSIDERATIONS OR PRECAUTIONS:

- Standard Personal Protective Equipment (PPE) shall be donned before performance of this Procedure
- Any additional PPE as identified in SDS or in this procedure shall be donned before performing this procedure
- See Unit Operation Manual for the Safety Systems and their Functions
- Process or waste streams cannot bypass air emission control device. Bypassing to the flare is permissible as an emergency air emission control device, but flaring of streams containing H_2S or sulfides shall be minimized
- Chemicals in any process may cause severe burns to eyes, skin and all body tissue. Eye damage may be permanent. In case of contact, immediately flush skin or eyes with abundant amount of water for at least 15 to 20 minutes while removing contaminated clothing. After required flush of affected area seek immediate medical attention
- In the event of a spill to ground, to the refinery sewer, or the storm water ditch, and/or in the event of a release to the atmosphere above allowable limits, immediately notify your Zone Supervisor and the Environmental Department. Determine cause of the situation and take immediate steps to correct it

4.0 REQUIRED EQUIPMENT:

None

5.0 REFERENCES:

- Wynnewood Safety Policies
- Wynnewood Operating Manual
- SDS-Asphalt

6.0 PROCEDURE: Truck Loading

6.1 OBTAIN weigh scale ticket at control room printer.

6.2 VERIFY truck driver fills out weigh scale ticket.

6.3 ENSURE truck driver has on proper PPE.

6.4 DIRECT driver to follow loading procedures posted at bottom & top of loading rack stairs.

NOTE

Silicone is an anti-foam agent and is always kept at the blender for trailers that are damp but not wet. Trailers that are damp will require about two quarts of silicone. Once the silicone is added to the trailer, asphalt can be added to the trailer, but at a slow rate. If silicone is added to a trailer, the loader will check the trailer after a small amount of asphalt has been added. The loader will determine if it is safe to continue loading the trailer or not.

6.5 ASSIST driver in calculating correct loading weight.

6.6 DIRECT truck to correct loading bay.

6.7 VERIFY truck is on correct loading bay.

6.8 Driver DELIVERS truck keys to the control room.

6.9 VERIFY truck driver has attached ground cable.

6.10 ENTER gallons from appropriate tank(s) to be loaded on Blendtrol.

6.11 LOWER walkway/safety cage onto trailer (truck driver).

6.12 ENSURE truck driver is working inside safety cage.

6.13 ENSURE truck driver chains down the spill to dome lid.

6.14 ENSURE truck driver opens correct valve to spill.

6.15 PRESS start button on Controllogix control panel to start pump(s).

6.16 COLLECT sample if necessary per SOP-3711-280.

6.17 DELIVER sample to Laboratory.

NOTE

Pump(s) will shutdown when required volume is reached on control board.

6.18 ENSURE truck driver closes correct valve to spill.

6.19 ENSURE truck driver disconnects ground cable.

6.20 REMOVE chain from spill (truck driver).

6.21 PLACE spill in drain box (truck driver).

6.22 RAISE walkway from trailer (truck driver).

6.23 Operator VERIFIES that rack is ready for the truck to pull out, then RETURN driver keys.

6.24 Truck PROCEEDS to scales.

6.25 COMPLETE card reader procedure SOP-3711-279.

End of Procedure

Attachment 5

Truck Unloading Rack Operation

1.0 PURPOSE:

This procedure provides safe and consistent instructions for Truck Unloading Rack Operation.

2.0 PREREQUISITES:

None

3.0 SPECIAL CONSIDERATIONS OR PRECAUTIONS:

- Standard Personal Protective Equipment (PPE) shall be donned before performance of this Procedure
- Any additional PPE as identified in SDS or in this procedure shall be donned before performing this procedure
- See Unit Operation Manual for the Safety Systems and their Functions
- Process or waste streams cannot bypass air emission control device. Bypassing to the flare is permissible as an emergency air emission control device, but flaring of streams containing H_2S or sulfides shall be minimized
- Chemicals in any process may cause severe burns to eyes, skin and all body tissue. Eye damage may be permanent. In case of contact, immediately flush skin or eyes with abundant amount of water for at least 15 to 20 minutes while removing contaminated clothing. After required flush of affected area seek immediate medical attention
- In the event of a spill to ground, to the refinery sewer, or the storm water ditch, and/or in the event of a release to the atmosphere above allowable limits, immediately notify your Zone Supervisor and the Environmental Department. Determine cause of the situation and take immediate steps to correct it

4.0 REQUIRED EQUIPMENT:

None

5.0 REFERENCES:

- Wynnewood Safety Policies
- Wynnewood Operating Manual
- SDS-Asphalt, Diesel, 100W, KW1, DH 170, and gasoline

6.0 PROCEDURE: Heavy Oils Truck Unloading.

6.1 PERFORM steps 6.2 through 6.6 if truck is from off site.

6.2 BRING truck into plant (truck driver).

6.3 PERFORM card reader procedure per SOP-3711-279 (truck driver).

6.4 OBTAIN weigh scale ticket at control room printer.

6.5 VERIFY truck driver fills out weigh scale ticket.

6.6 DIRECT driver to follow loading procedures posted at bottom & top of loading rack stairs.

6.7 DIRECT truck to heavy oil unloading rack.

6.8 OPEN dome lid on trailer (truck driver).

6.9 CONNECT ground wire to trailer (truck driver).

6.10 CHECK unloading hose and pump for water.

6.11 OPEN drain, rotate pump and drain hose if water is found.

6.12 PROCEED to step 6.13 if no water is found.

6.13 CONNECT unloading hose (truck driver).

6.14 LINE UP unloading pump (P1481) discharge line to appropriate tank.

6.15 OPEN P1481 suction valve.

6.16 OPEN truck outlet valve (truck driver).

6.17 START P1481 per SOP-3711-202.

6.18 MONITOR product level at dome lid in trailer while unloading (truck driver).

6.19 CLOSE truck outlet valve when required amount of product is transferred (truck driver).

6.20 DISCONNECT unloading hose (truck driver).

6.21 ENSURE hose is emptied.

6.22 DISCONNECT ground wire from trailer.

6.23 SHUTDOWN P1481 per SOP-3711-202.

7.0 136 Unloading Rack.

7.1 BRING truck into plant (truck driver).

7.2 DIRECT truck to weigh scale.

7.3 POSITION truck on weigh scale.

7.4 RECORD inbound weight on bill of lading form.

7.5 DIRECT truck to 136 unloading rack.

7.6 OPEN dome lid on trailer (truck driver).

7.7 CALL light oil blender to sample truck per SOP-3711-284.

7.8 CONNECT ground wire to trailer (truck driver).

7.9 CONNECT unloading hose (truck driver).

7.10 LINE UP unloading pump (TP-253B) discharge line to appropriate tank.

7.11 START TP-253B per SOP-3711-202.

7.12 OPEN TP-253B suction valve.

7.13 OPEN truck outlet valve (truck driver).

7.14 MONITOR product level at dome lid in trailer while unloading (truck driver).

7.15 CLOSE truck outlet valve when required amount of product is transferred (truck driver).

7.16 CLOSE dome lid on trailer (truck driver).

7.17 DISCONNECT unloading hose (truck driver).

7.18 DIRECT truck to weigh scale.

7.19 POSITION truck on weigh scale.

7.20 RECORD outbound weight on bill of lading form.

7.21 SIGN bill of lading (operator and truck driver).

7.22 DELIVER plant copies of bill of lading to inbox at weigh scale building.

7.23 Truck EXITS plant.

8.0 TP1337 Heavy Oils Truck Unloading

8.1 PERFORM steps 6.2 through 6.6 if truck is from off site.

8.2 BRING truck into plant (truck driver).

8.3 PERFORM card reader procedure per SOP-3711-279 (truck driver).

8.4 OBTAIN weigh scale ticket at control room printer.

8.5 VERIFY truck driver fills out weigh scale ticket.

8.6 DIRECT driver to follow loading procedures posted at bottom & top of loading rack stairs.

8.7 DIRECT truck to heavy oil unloading rack.

8.8 OPEN dome lid on trailer (truck driver).

8.9 CONNECT ground wire to trailer (truck driver).

8.10 CHECK unloading hose and pump for water.

8.11 OPEN drain, rotate pump and drain hose if water is found.

8.12 PROCEED to step 6.13 if no water is found.

8.13 CONNECT unloading hose (truck driver).

NOTE:

Cam lock ears need to be wired closed.

8.14 VERIFY available room in desired tank.

8.15 LINE UP unloading pump (TP1337) discharge line to appropriate tank.

8.16 OPEN TP1337 suction valve.

8.17 OPEN truck outlet valve (truck driver).

8.18 START TP1337 per SOP-3711-203.

8.19 MONITOR product level at dome lid in trailer while unloading (truck driver).

8.20 CLOSE truck outlet valve when required amount of product is transferred (truck driver).

8.21 DISCONNECT unloading hose (truck driver).

8.22 ENSURE hose is emptied.

8.23 DISCONNECT ground wire from trailer.

8.24 SHUTDOWN TP1337 per SOP-3711-203.

End of Procedure

Attachment 6

Solvent Rack Truck Loading

1.0 PURPOSE:

This procedure provides safe and consistent instructions for Operation of Solvent Rack Truck Loading.

2.0 PREREQUISITES:

None

3.0 SPECIAL CONSIDERATIONS OR PRECAUTIONS:

- Standard Personal Protective Equipment (PPE) shall be donned before performance of this Procedure
- Any additional PPE as identified in SDS or in this procedure shall be donned before performing this procedure
- See Unit Operation Manual for the Safety Systems and their Functions
- Process or waste streams cannot bypass air emission control device. Bypassing to the flare is permissible as an emergency air emission control device, but flaring of streams containing H_2S or sulfides shall be minimized
- Chemicals in any process may cause severe burns to eyes, skin and all body tissue. Eye damage may be permanent. In case of contact, immediately flush skin or eyes with abundant amount of water for at least 15 to 20 minutes while removing contaminated clothing. After required flush of affected area seek immediate medical attention
- In the event of a spill to ground, to the refinery sewer, or the storm water ditch, and/or in the event of a release to the atmosphere above allowable limits, immediately notify your Zone Supervisor and the Environmental Department. Determine cause of the situation and take immediate steps to correct it

4.0 REQUIRED EQUIPMENT:

None

5.0 REFERENCES:

- Wynnewood Safety Policies
- Wynnewood Operating Manual
- SDS-100W
- SDS-KW1

- SDS-LCO Light Cycle Oil
- SDS-DH170
- SDS-Naphtha
- SOP-3711-201, Electric Centrifugal Pumps Operation
- SOP-3711-279, Card Reader Procedure

6.0 PROCEDURE: Truck Loading.

6.1 OBTAIN weigh scale ticket at control room printer.

6.2 VERIFY truck driver fills out weigh scale ticket.

6.3 ENSURE truck driver signs weigh scale ticket stating trailer is clean.

6.4 CALCULATE correct loading weight if necessary.

6.5 CALCULATE correct gallons to be loaded on truck.

6.6 DIRECT truck to solvent loading bay.

6.7 PLACE wheel chocks between duals (truck driver).

6.8 OPEN trailer vents (truck driver).

6.9 VERIFY truck motor is off.

6.10 CONNECT two-ball ground system (truck driver).

6.11 NOTIFY Light Oils which product is to be loaded.

6.12 VERIFY loading arm sight glass is clear and free of dye.

6.13 CONNECT loading arm to trailer (truck driver).

WARNING

DO NOT leave bypass valve around DH 170 control valve open when loading products other than DH 170. Failure to close bypass valve may result in off spec product.

6.14 UNLOCK correct valve(s) at loading rack.

6.15 OPEN correct valve(s) at loading rack.

6.16 START appropriate pump(s) at local panel per SOP-3711-201 (Electric Centrifugal Pumps Operation).

NOTE

Depending on the type of trailer being loaded, the mini-load meter may need to be set only once. Single compartment trailers will require only one meter setting to fill the trailer. Multi-compartment trailers could require as many as five meter settings before the trailer is loaded.

6.17 PRESS clear button at mini-load meter at loading rack.

6.18 PRESS set button.

6.19 ENTER gallons required on mini-load meter.

6.20 PRESS start button.

6.21 INJECT red dye into KW1 when required per the following:

A. OPEN quick opening discharge valve on loading arm from red dye pump.

B. OPEN suction valve from red dye tote to dye pump.

C. VERIFY minimum flow valve on dye pump is open.

D. UNLOCK local switch on dye pump.

E. PLACE dye pump switch in auto position to start pump.

NOTE

Close the quick opening valve on the loading arm from the dye pump once the pump ramps down to 100gpm. This will clear all dye from the line.

F. Driver will WATCH flow meter down to the last 100gpm.

G. SHUTDOWN red dye pump.

H. BLOCK quick opening valve on the loading arm from the dye pump.

I. Line should clear of dye as the remaining 100 gallons flush the line into the trailer.

6.22 COLLECT sample after loading approximately 400 gallons as per the following:

A. OPEN sample line to barrel.

B. PURGE line until clear.

C. PLACE sample bottle under sample line.

D. FILL sample bottle.

E. LABEL sample bottle.

F. DELIVER sample to Laboratory.

NOTE

Transfer will shutdown when required volume is reached on local control panel.

(Valve closes but pump stays running.)

6.23 SHUTDOWN loading pump when loading is complete.

6.24 CLOSE correct valve(s) at loading rack.

6.25 DISCONNECT loading arm from trailer (truck driver).

6.26 REMOVE wheel chocks (truck driver).

6.27 CLOSE trailer vents (truck driver).

6.28 DISCONNECT two-ball ground system (truck driver).

6.29 VERIFY loading arm sight glass is clear and no trace of dye remains.

6.30 PROCEED to scales (truck driver).

6.31 COMPLETE card reader procedure SOP-3711-279 (Card Reader Procedure).

End of Procedure

Attachment 7

Asphalt Railcar Loading

1.0 PURPOSE:

This procedure provides safe and consistent instructions Asphalt Railcar Loading.

2.0 PREREQUISITES:

- None

3.0 SPECIAL CONSIDERATIONS OR PRECAUTIONS:

- Standard Personal Protective Equipment (PPE) shall be donned before performance of this Procedure
- Any additional PPE as identified in SDS or in this procedure shall be donned before performing this procedure
- See Unit Operation Manual for the Safety Systems and their Functions
- Process or waste streams cannot bypass air emission control device. Bypassing to the flare is permissible as an emergency air emission control device, but flaring of streams containing H_2S or sulfides shall be minimized
- Chemicals in any process may cause severe burns to eyes, skin and all body tissue. Eye damage may be permanent. In case of contact, immediately flush skin or eyes with abundant amount of water for at least 15 to 20 minutes while removing contaminated clothing. After required flush of affected area seek immediate medical attention
- In the event of a spill to ground, to the refinery sewer, or the storm water ditch, and/or in the event of a release to the atmosphere above allowable limits, immediately notify your Zone Supervisor and the Environmental Department. Determine cause of the situation and take immediate steps to correct it

4.0 REQUIRED EQUIPMENT:

- N/A.

5.0 REFERENCES:

- P&ID
- Wynnewood Safety Policies
- Heavy Oils Operating Manual
- Tank Car Inspection Report
- Tank Car Daily Loading Report
- MSDS

6.0 PROCEDURE: Startup.

6.1 COMMUNICATE with Blender what product is to be loaded that day.

6.2 VERIFY cars spotted match cars on switch list for car number and product.

- Notify Transportation Coordinator and Zone Supervisor of any discrepancies.

6.3 ENSURE railroad gate is closed and signs and derailers are in correct position.

6.4 CHOCK wheels on railcar.

6.5 GROUND railcar.

NOTE:

It is very important that each section of the form be checked very carefully. Any railcars that are loaded and shipped, that failed any part of the inspection form, would be subject to a very large fine from the Federal Railroad Administration. Ensure that railcars leaving that plant are that correct railcar and they meet all Federal Railroad law requirements.

6.6 INSPECT railcar and record information on the following reports:

- Tank Car Inspection Report
- Daily Loading Report

NOTE:

If a railcar fails inspection, **DO NOT** load and inform Zone supervision.

6.7 VERIFY placards are in place, in good condition and official placards.

6.8 REMOVE belly valve cap and VERIFY gasket is in place.

6.9 TIGHTEN belly valve cap with a 36" pipe wrench.

6.10 ENSURE belly valves open and close. LEAVE in closed position.

6.11 BEGIN opening dome lids and placing spills into cars. Spills must be chained.

NOTE:

DO NOT open spill valves at this time.

6.12 VERIFY no water is in railcar. If water is found, STOP and inform supervision.

SAFETY WARNING

DO NOT load product into a car that has water in it. Failure to comply with this warning may result in a spill and/or personal injury.

6.13 ENSURE all reports are complete and VERIFY information with Transportation Coordinator

6.14 NOTIFY asphalt blender on channel (4) you are ready to load one of the following products:

- HVTB #2 vacuum tower bottoms
- LVTB #3 vacuum tower bottoms
- PG64-22

6.15 OPEN spill valve.

6.16 OPEN loading valve after asphalt blender has informed you product had been lined up and ready to load.

6.17 INFORM asphalt blender the valve is open and flow is established.

6.18 VISUALLY watch as railcar is filling with product.

SAFETY WARNING

Railcars will overfill if left unattended. Failure to comply with this warning may result in personal injury.

6.19 LOAD railcar to the correct outage gauge from the switch list.

6.20 START flow into the next railcar before closing loading valve on the railcar being loaded. (Continue until last railcar)

NOTE:

If the railcar calls to switch cars: make a walkthrough on the side you **ARE NOT** loading on. Walk down open derailer and remove signs for that side, open gates and return to loading rack. Once railroad has made their switch, return to the gate, set signs and derailer back in position, lock gate back and return to loading rack.

6.21 NOTIFY the asphalt blender at least 15 mins before the last car is finished loading. STAY in radio communication with the asphalt blender on Channel 4 during this time.

6.22 NOTIFY the Asphalt Blender that their pump can be shut down when your loading is complete.

6.23 VERIFY all loading and spill valves are closed.

6.24 OPEN the loading valve and circulating valve on the last spot loaded.

6.25 INFORM asphalt blender you are ready to circulate.

6.26 REPLACE all dome gaskets with new black gaskets.

NOTE:

BLACK gaskets are for Asphalt loading only. **WHITE** gaskets are for Solvent loading only.

6.27 CLOSE dome lids and tighten down.

6.28 VERIFY ball valves operate.

6.29 CAR SEAL the dome lid, belly valve and relief valve cover, if applicable.

6.30 REMOVE wheel chocks and grounding cables from each car.

6.31 WALKDOWN and visually inspect the following:

- Car seals
- Placards
- Wheel chocks removed
- Grounding cables removed
- All spill valves are closed
- Dispose of trash

6.32 NOTIFY asphalt blender that reports are ready to be picked up.

End of Procedure

Attachment 8

Solvent Railcar Loading

1.0 PURPOSE:

This procedure provides safe and consistent instructions for Solvent Railcar Loading.

2.0 PREREQUISITES:

- None

3.0 SPECIAL CONSIDERATIONS OR PRECAUTIONS:

- Standard Personal Protective Equipment (PPE) shall be donned before performance of this Procedure
- Any additional PPE as identified in SDS or in this procedure shall be donned before performing this procedure
- See Unit Operation Manual for the Safety Systems and their Functions
- Process or waste streams cannot bypass air emission control device. Bypassing to the flare is permissible as an emergency air emission control device, but flaring of streams containing H_2S or sulfides shall be minimized
- Chemicals in any process may cause severe burns to eyes, skin and all body tissue. Eye damage may be permanent. In case of contact, immediately flush skin or eyes with abundant amount of water for at least 15 to 20 minutes while removing contaminated clothing. After required flush of affected area seek immediate medical attention
- In the event of a spill to ground, to the refinery sewer, or the storm water ditch, and/or in the event of a release to the atmosphere above allowable limits, immediately notify your Zone Supervisor and the Environmental Department. Determine cause of the situation and take immediate steps to correct it

4.0 REQUIRED EQUIPMENT:

- N/A.

5.0 REFERENCES:

- P&ID
- Wynnewood Safety Policies
- Heavy Oils Operating Manual
- Tank Car Inspection Report
- Tank Car Daily Loading Report
- MSDS

6.0 PROCEDURE: Startup.

6.1 VERIFY cars spotted match cars on switch list for car number and product.

- Notify Transportation Coordinator and Zone supervisor of any discrepancies.

6.2 ENSURE railroad gate is closed and signs and derailers are in correct position.

6.3 CHOCK wheels on railcar.

6.4 GROUND railcar.

> **NOTE:**
>
> It is very important that each section of the form be checked very carefully. Any railcars that are loaded and shipped, that failed any part of the inspection form, would be subject to a very large fine from the Federal Railroad Administration. Ensure that railcars leaving the plant are the correct railcar and they must meet all Federal Railroad law requirements.

6.5 INSPECT railcar and record information on the following reports:

- Tank Car Inspection Report
- Daily Loading Report

> **NOTE:**
>
> If a railcar fails inspection**, DO NOT** load and inform Zone supervision.

6.6 VERIFY placards are in place, in good condition and official placards.

6.7 REMOVE belly valve cap and VERIFY gasket is in place.

6.8 TIGHTEN belly valve cap with a 36” pipe wrench.

6.9 ENSURE belly valves open and close. LEAVE in the closed position.

6.10 BEGIN opening dome lids and placing spills into cars. Spills must be chained.

NOTE:

DO NOT open spill valves at this time. Ensure spills are chained down. Failure to do so may result in loss of product and personal injury.

6.11 ENSURE all reports are complete and VERIFY information with Transportation Coordinator.

6.12 NOTIFY Light Oils you are ready to load one of the following products:

- 100-W
- KW-1

6.13 OPEN spill valve.

6.14 OPEN loading valve after Light Oils has informed you product had been lined up and ready to load.

6.15 START 250 or 251TK pump switch on the North side of the Shack.

6.16 VISUALLY watch as railcar is filling with product.

SAFETY WARNING

Railcars will overfill if left unattended. Failure to comply with this warning may result in personal injury.

6.17 CATCH sample of solvent product in a clear glass quart bottle. LABEL bottle with railcar #, date, time, product and initials of loader. PLACE in sample barrel at Crude unit.

NOTE:

If the railroad calls to switch cars; make a walk through on the side you **ARE NOT** loading on. Walk down open derailer and remove signs for that side, open gates and return to loading rack. Once railroad has made their switch, return to the gate, set signs and derailer back in position, lock gate back and return to loading rack.

6.18 LOAD railcar to correct outage gauge from the switch list.

6.19 STOP loading pump at switch North of the Shack.

6.20 VERIFY all loading and spill valves are closed.

6.21 REPLACE all dome gaskets with new white gaskets.

NOTE:

BLACK gaskets are for Asphalt loading only. **WHITE** gaskets are for Solvent loading only.

6.22 CLOSE dome lids and tighten down.

6.23 VERIFY ball valves operate.

6.24 CAR SEAL the dome lid, belly valve and relief cover, if applicable.

6.25 REMOVE wheel chocks and grounding cables from each car.

6.26 WALKDOWN and visually INSPECT the following:

- Car seals
- Placards
- Wheel chocks removed
- All spill valves are closed.
- Dispose of trash.

6.27 VERIFY all walkways are raised and chained in the up position.

6.28 NOTIFY asphalt blender that reports are ready to be picked up.

End of Procedure

Attachment 9

LACT – Crude Oil Loading and Unloading

1.0 PURPOSE:

This procedure defines the steps to safely load crude oil from lease sites and unload into a CRCT owned or operated facility while minimizing the possibility of adverse environmental impact and equipment damage.

2.0 PROCEDURE:

NOTE:

- All drivers MUST remain in attendance at all times when in the process of receiving or discharging product. Drivers SHALL NOT be in the cab of the truck. The driver MUST be out of the truck and on the ground with an unobstructed view of the process, within 25” of the trailer. It is permissible to complete the truck inspection (tires, placards, etc.) during the loading/unloading process.
- Always consider the vapor trail to prevent a truck engine runaway due to excessive vapors - Do Not breathe the vapors

2.1 **Truck Loading Process:**

2.1.1 When approaching lease site check surroundings to verify conditions are safe and obstruction free. Plan an exit strategy as entering the lease site.

2.1.2 Position the cargo tank adjacent to the unloading box and tail pump.

2.1.3 Verify lease name, producer and lease number match same information on the run ticket.

2.1.4 Don proper personal protective equipment (PPE) required for loading - safety glasses, gloves, H_2S monitor, (Respirators may be required pending tank markings or H2S monitor alarm).

2.1.5 Set out the safety cones, positioning one at the front and one at the back of the tractor trailer unit on the receiving side. These cones serve as a reminder to the driver to perform his walk around inspection before starting the loading process and again at the completion of the loading process.

2.1.6 Verify stairs and catwalk are safe to access. (i.e., oil, ice, water, structural integrity, etc.)

2.1.7 Start “working oil” by taking samples from the middle and bottom tank levels. Use gauge line to determine top tank level.

2.1.8 Combine 100 ml of crude oil with 100 ml of solvent and heat to a minimum temperature of 140 degrees F.

2.1.9 After samples reach 140 degrees F place in centrifuge for 3-5 minutes to determine “Grind Out” (% BS&W).

2.1.10 Before beginning the loading process, the driver shall walk around his truck to ensure that all valves not intended for product receipt are closed and secure.

2.1.11 Once walk around is complete and while samples are in centrifuge, properly ground trailer with grounding cable and connect trailer hose to load line .

NOTE

If “Grind Out” determines crude oil is not to desired quality (greater than 1%), remove hose from header, clean oil testing equipment and leave rejection ticket for producer.

2.1.12 If “Grind Out” determines crude oil is of desired quality (less than 1% BS&W) then engage PTO and increase truck RPM to 1000.

2.1.13 Open fire valve and vent valve on trailer.

2.1.14 Remove seal on tank and open tank valve.

2.1.15 Double check all valves are properly lined up to the correct position and start trailer pump.

2.1.16 Place hand under trailer vent to verify correct rotation of pump. (Air should be blowing out while loading).

2.1.17 While loading, complete truck and trailer walk around noting anything needing repaired or replaced. This walk around shall include examining each tire, which is required every time the vehicle is parked. Document on pre-trip inspection form to be addressed later by truck maintenance, or when possible fix the problem after loading process is completed.

2.1.18 Pay attention to level gauge and sloping terrain on which the trailer is parked. (Rule of thumb to determine trailer weight is a full load = 130 bbl + gravity).

2.1.19 When loaded, close tank valve and header valve. Allow hose to drain then shut pump valve and turn off trailer pump then shut off trailer pump and disconnect hose.

2.1.20 Close belly valve and vent valve on trailer then disconnect hose and secure cap before placing in holder.

2.1.21 Remove grounding cable.

2.1.22 Get bottom measurement on tank and clean oil testing equipment.

2.1.23 Complete paperwork, then place new seal on tank and leave a copy of the run ticket at lease site.

2.1.24 Double check all valves are in the correct position prior to leaving the lease site.

2.2 **Truck Unloading Process:**

NOTE:

- Drivers are required to stay within 25' of trailer during the entire unloading process.
- Tail pumps and multiple trucks unloading produce a high flow of vapors from tank vents.
- There is always the potential for the tanks not to have an equal level when filling rapidly.
- Warmer oil and higher gravity condensate increases vapor production, and if mixed, vapor expansion is multiplied.
- When filling tanks at a high level, it may be necessary to slow down the filling process by not using the tail pump and only unloading one truck at a time.
- Do not unload unless there is room for the entire load.
- Inspect hose and coupling gaskets. Do not use a hose that is likely to seep, leak or split.

2.2.1 Don proper personal protective equipment (PPE) required for unloading - safety glasses, gloves, H_2S monitor.

2.2.2 Set out the safety cones, positioning one at the front and one at the back of the tractor trailer unit on the receiving side. These cones serve as a reminder to the driver to perform his walk around inspection before starting the unloading process and again at the completion of the unloading process.

2.2.3 Before beginning the unloading process, the driver shall walk around his truck to ensure that all valves not intended for product unloading are closed and secure. The driver shall also verify the tail pump valve and any associated bleeder valve(s) are in the correct position.

2.2.4 Ensure that adequate storage space is available in the tank.

2.2.5 Check the daily station log and complete required log information. (Date, name, time, tank gauge level, and barrels unloaded) Tank gauge levels may not be available at all stations.

2.2.6 Verify proper line up of the valves to ensure the crude oil will flow to all the crude oil tanks.

2.2.7 Connect grounding cable.

2.2.8 Connect hose from the truck pump to the unloading box header.

2.2.9 Connect hose from the tail pump to the truck belly valve.

2.2.10 Open the valve in the containment box.

2.2.11 Open the tail pump suction valve and verify the discharge valve is open.

2.2.12 Open the cargo tank belly valve.

2.2.13 Open the cargo tank vent (Control lever).

2.2.14 Open the cargo tank internal valve (Control lever).

2.2.15 Open the cargo tank unloading valve from the cargo tank manifold to tail pump.

2.2.16 Open the cargo tank unloading discharge valve from the truck pump.

2.2.17 Start the tail pump first then truck pump.

2.2.18 Ensure the cargo tank vent is sucking in air.

2.2.19 While unloading, perform frequent hose and equipment checks to ensure there are no leaks, seeps or spills during the unloading process. Monitor the tank(s) level during the filling process.

2.2.20 While loading, complete truck and trailer walk around noting anything needing repaired or replaced. This walk around shall include examining each tire, which is required every time the vehicle is parked. Document on pre-trip inspection form to be addressed later by truck maintenance, or when possible fix the problem after loading process is completed.

2.2.21 When unloading is completed shut cargo tank valve to tail pump hose.

2.2.22 Crack ears on tail pump hose to suck hose clean but leave hose on cargo tank connection.

2.2.23 Close tail pump suction valve and turn off the tail pump.

2.2.24 Disconnect tail pump hose from cargo tank and hang hose on the tail pump hanger/cap. (Note: Break the connection carefully using a rag to prevent oil from spilling.)

2.2.25 Replace cap on cargo tank tail pump connection.

2.2.26 Reverse the truck pump.

2.2.27 Close the containment box valve.

2.2.28 Crack ears on hose at the containment box. (Note: Break the connection carefully using a rag to prevent oil from spilling.)

2.2.29 Close the cargo tank discharge valve.

2.2.30 Shut down truck pump.

2.2.31 Remove and plug hose and place cap on containment box connection and replace hose in hangers.

2.2.32 Close “belly valve”.

2.2.33 Close the vent and internal valves by the control levers.

2.2.34 Close the containment box lid.

2.2.35 Record the amount pumped into the facility on the daily log.

2.2.36 Perform a walk around inspection on cargo tank and truck before departing.

2.3 **Training:**

2.3.1 New employees will be trained initially on this procedure prior to operating on their own in the field.

2.3.2 Employees will be required to review this procedure annually.

3.0 REFERENCES:

3.1 **Regulatory –** None.

3.2 **Related Policies/Procedures –** Spill Prevention Control and Counter Measure Plans (SPCC).

3.3 **Forms and Attachments –** 8.04-ADM-002, Station Unloading Log Form.

➢➢➢End of Procedure⮘⮘⮘

Appendix J

Inspections, Tests and Evaluations

Table 21

Aboveground Storage Tanks – Inspection and Integrity Test Requirements

Tank Number	Fabrication Type	Maximum Capacity (Bbls)	Size				Secondary Containment	Continuous Release Detection Employed?	Inspection and Integrity Test Standards & Schedule
			Diameter		Length/Height				
			Feet	Inches	Feet	Inches			
MSA-1									
6D-1	Shop-fabricated	564	10	10	27	4	--	--	(4)
6D-4	Shop-fabricated	564	10	10	27	4	--	--	(4)
D-170	Shop-fabricated	712	9	0	57	0	--	--	(4)
D-172	Shop-fabricated	712	9	0	57	0	--	--	(4)
D-174	Shop-fabricated	712	8	10	59	4	--	--	(4)
D-176	Shop-fabricated	712	8	10	59	4	--	--	(4)
D-178	Shop-fabricated	712	9	0	57	0	--	--	(4)
D-180	Shop-fabricated	712	9	0	57	0	--	--	(4)
D-190	Shop-fabricated	565	10	10	27	4	--	--	(4)
D-191	Shop-fabricated	1,164	10	10	63	9	--	--	(4)
D-1401	Shop-fabricated	1,581	12	0	70	6	--	--	(4)
D-1402	Shop-fabricated	1,581	12	0	70	6	--	--	(4)
D-1403	Shop-fabricated	1,581	12	0	70	6	--	--	(4)
D-1404	Shop-fabricated	1,581	12	0	70	6	--	--	(4)
D-1405	Shop-fabricated	1,581	12	0	70	6	--	--	(4)
D-1406	Shop-fabricated	2,143	11	0	122	5	--	--	(4)
D-1407	Shop-fabricated	2,143	11	0	122	5	--	--	(4)
D-1408	Shop-fabricated	2,143	11	0	122	5	--	--	(4)
MSA-2									
126	Field-erected	79,500	117	0	42	0	(5)	(6)	API 653
202	Field-erected	80,000	120	0	40	0	(5)	(6)	API 653
MSA-3									
1181	Field-erected	100,000	110	0	60	0	--	--	(1)
MSA-4									
951	Field-erected	10,000	42	6	40	0	--	--	**Out-of-Service**
953	Field-erected	10,000	42	6	40	0	--	--	**Out-of-Service**
2051	Field-erected	20,000	60	0	40	0	(5)	(6)	API 653
MSA-5									
2007	Field-erected	5,100	34	1	30	0	(5)	(6)	API 653

Table 21 (Cont'd)

Aboveground Storage Tanks – Inspection and Integrity Test Requirements

Tank Number	Fabrication Type	Maximum Capacity (Bbls)	Size				Secondary Containment	Continuous Release Detection Employed?	Inspection and Integrity Test Standards & Schedule
			Diameter		Length/Height				
			Feet	Inches	Feet	Inches			
MSA-6									
1470	Field-erected	79,600	120	0	40	0	(5)	(6)	API 653
1471	Field-erected	34,800	74	0	48	0	(5)	(6)	API 653
1472	Field-erected	34,700	80	0	40	0	(5)	(6)	API 653
1473	Field-erected	9,600	42	6	40	0	(5)	(6)	API 653
1475	Field-erected	34,700	80	0	40	0	(5)	(6)	API 653
1476	Shop-fabricated	170	10	0	12	0	--	--	**Out-of-Service**
MSA-7									
67	Field-erected	68,884	112	0	39	6	(5)	(6)	API 653
68	Field-erected	68,884	112	0	39	6	(5)	(6)	API 653
69	Field-erected	68,884	112	0	39	6	(5)	(6)	API 653
70	Field-erected	150,000	140	0	50	0	(5)	(6)	API 653
71	Field-erected	250,000	200	0	48	0	(5)	(6)	API 653
MSA-8									
D-182	Shop-fabricated	1,427	10	10	79	8	--	--	(4)
D-183	Shop-fabricated	1,427	10	10	79	8	--	--	(4)
D-184	Shop-fabricated	1,533	10	4	94	0	--	--	(4)
D-185	Shop-fabricated	1,533	10	4	94	0	--	--	(4)
D-186	Shop-fabricated	2,370	11	0	112	0	--	--	(4)
D-187	Shop-fabricated	2,400	12	0	112	0	--	--	(4)
MSA-9									
254	Field-erected	24,800	67	0	40	0	(5)	(6)	API 653
255	Field-erected	24,800	67	0	40	0	(5)	(6)	API 653
MSA-10									
150	Field-erected	24,800	67	0	40	0	(5)	(6)	API 653
152	Field-erected	24,800	67	0	40	0	(5)	(6)	API 653
154	Field-erected	24,800	67	0	40	0	(5)	(6)	API 653
155	Field-erected	40,000	80	0	50	0	(5)	(6)	API 653
156	Field-erected	2,500	--	--	--	--	--	--	**Out-of-Service**

Table 21 (Cont'd)

Aboveground Storage Tanks – Inspection and Integrity Test Requirements

Tank Number	Fabrication Type	Maximum Capacity (Bbls)	Size				Secondary Containment	Continuous Release Detection Employed?	Inspection and Integrity Test Standards & Schedule
			Diameter		Length/Height				
			Feet	Inches	Feet	Inches			
MSA-11									
111	Field-erected	5,000	35	0	30	0	(5)	(6)	API 653
256	Field-erected	5,000	35	0	30	0	(5)	(6)	API 653
257	Field-erected	10,000	42	6	40	0	(5)	(6)	API 653
MSA-12									
108	Field-erected	13,800	56	9	30	6	(5)	(6)	API 653
110	Field-erected	15,000	52	0	40	0	(5)	(6)	API 653
250	Field-erected	10,000	42	6	40	0	(5)	(6)	API 653
251	Field-erected	10,000	42	6	40	0	(5)	(6)	API 653
MSA-13									
107	Field-erected	78,000	117	5	41	1	--	--	(3)
120	Field-erected	2,800	27	6	26	0	--	--	**Out-of-Service**
134	Field-erected	80,000	120	0	40	0	(5)	(6)	API 653
260	Field-erected	5,100	35	0	30	0	(5)	(6)	API 653
262	Field-erected	5,100	35	0	30	0	(5)	(6)	API 653
263[7]	Field-erected	5,100	35	0	30	0	(5)	(6)	API 653
264	Field-erected	5,100	35	0	30	0	(5)	(6)	API 653
265	Field-erected	5,100	35	0	30	0	(5)	(6)	API 653
269	Field-erected	5,100	35	0	30	0	(5)	(6)	API 653
601	Field-erected	5,000	35	0	35	0	(5)	(6)	API 653
1321	Field-erected	5,000	30	0	40	0	--	--	(3)
1323	Field-erected	4,512	34	3	27	5	--	--	(3)
1331	Field-erected	5,000	30	0	40	0	--	--	(3)
1332	Field-erected	5,000	30	0	40	0	--	--	(3)
1333	Field-erected	5,000	30	0	40	0	--	--	(3)
1337	Field-erected	2,000	18	6	32	0	--	--	**Closed**
1338	Field-erected	2,000	18	6	32	0	--	--	**Closed**
2002	Shop-fabricated	100	9	6	8	0	--	--	**Out-of-Service**
MSA-14									
136	Field-erected	75,470	120	0	40	0	(5)	(6)	API 653
138	Field-erected	80,456	120	0	40	0	(5)	(6)	API 653
140	Field-erected	80,000	120	0	40	0	(5)	(6)	API 653

Table 21 (Cont'd)
Aboveground Storage Tanks – Inspection and Integrity Test Requirements

Tank Number	Fabrication Type	Maximum Capacity (Bbls)	Size				Secondary Containment	Continuous Release Detection Employed?	Inspection and Integrity Test Standards & Schedule
			Diameter		Length/Height				
			Feet	Inches	Feet	Inches			
MSA-15									
101	Field-erected	64,000	106	0	40	10	(5)	(6)	API 653
1324	Field-erected	66,590	110	0	40	0	(5)	(6)	API 653
MSA-16									
252	Field-erected	26,800	73	5	35	8	(5)	(6)	API 653
253	Field-erected	25,000	67	0	40	0	(5)	(6)	API 653
MSA-17									
1449	Field-erected	76,425	119	0	39	0	(5)	(6)	API 653
MSA-18									
2003	Field-erected	86,000	130	0	40	0	--	--	(1)
MSA-19									
2004	Field-erected	54,356	90	0	48	0	--	--	(2)
2005	Field-erected	20,000	55	0	48	0	--	--	(2)
MSA-20									
142	Field-erected	55,000	100	0	40	0	(5)	(6)	API 653
143	Field-erected	55,000	100	0	40	0	(5)	(6)	API 653
144	Field-erected	55,000	100	0	40	0	(5)	(6)	API 653
146	Field-erected	80,000	120	0	40	0	(5)	(6)	API 653
164	Field-erected	10,000	42	0	42	0	(5)	(6)	API 653
MSA-21									
147	Field-erected	80,000	120	0	40	0	(5)	(6)	API 653
148	Field-erected	75,900	120	0	40	0	(5)	(6)	API 653
168	Field-erected	35,700	79	5	40	0	(5)	(6)	API 653
MSA-22									
501	Field-erected	25,700	62	6	48	0	(5)	(6)	API 653
1441	Field-erected	35,700	80	0	40	0	(5)	(6)	API 653
MSA-23									
203	Field-erected	80,000	120	0	40	0	(5)	(6)	API 653
MSA-24									
200	Field-erected	80,000	120	0	40	0	(5)	(6)	API 653
204	Field-erected	150,000	146	0	52	0	(5)	(6)	API 653
MSA-25									
303	Field-erected	250,000	200	0	48	0	(5)	(6)	API 653

Table 21 Legend

[1] Exempt pursuant to 40 C.F.R. 112.1(b).
[2] Exempt pursuant to 40 C.F.R. 112.1(d)(6).
[3] Exempt pursuant to 40 C.F.R. 112.1(d)(8).
[4] Exempt pursuant to 67 FR 47076 dated July 17, 2002.
[5] Table 6 of Appendix F.
[6] Periodic visual inspections by qualified WRC personnel. Any deficiencies identified are promptly corrected.

Aboveground storage tank inspections, schedules, and records are maintained by the Zone 4 operations department and refinery Inspection department.

Appendix K

Oil Discharge History

WYNNEWOOD
REFINING™
A CVR Refining, LP Company

Facility ID No. I-25000220

May 28, 2013

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Cheryl Dirck
Water Quality Division
Oklahoma Department of Environmental Quality
P.O. Box 1677
Oklahoma City, OK 73101-1677

Subject: Notification of Bypasses, Wynnewood Refining Company, LLC OPDES Permit # OK0000825

Dear Ms. Dirck:

Enclosed find completed wastewater bypass forms for two bypass events and a possible bypass event which occurred as a result of heavy rainfall events at our refinery on 5/21/13 and 5/23/13. This letter is to provide additional information regarding each of the events.

5/21/13 Wastewater Treatment System Bypass
On 5/21/13, the Wynnewood Refining Company experienced very heavy rainfall during the morning, just prior to my 8:50 notification to you. There had been rainfall and hail the preceding night as well. Wynnewood residents reported over 5" of rainfall for 5/21. During the morning storm event, our stormwater flow meter registered an instantaneous flow of over 35,000 gpm. A discharge of oil sheen was reported to the National Response Center. Total flow for the 5/21 event shown by our stormwater flowmeter was over 8.1 million gallons.

Our combined process/stormwater storage already contained some previous inventory from rainfall of 5/15 and 5/16. Hence, with the onset of heavy rain, our stormwater diversion storage, along with all available normal wastewater treatment system tankage, quickly became filled to capacity. Our combined process/stormwater channel (just upstream of our API separator) overflowed into our stormwater ditch, causing the bypass. The amount of bypass is unknown.

The initial bypass stopped around 9:30 AM when rainfall subsided. The wastewater plant worked off stormwater inventory as quickly as possible and brought in additional portable pumps to speed up flow through our lagoons and discharge at our treatment plant outfall. Then it began raining again around noon, although at a somewhat slower rate than during the morning. The combined process/stormwater channel overflowed again intermittently beginning around 12:30 PM until around 2:45 PM. Our stormwater diversion sump is located along this channel. As we were able to "nurse off" and pump from this sump to storage as it became available, we were able to intermittently stop channel overflows until the flow surge subsided. Additional steps were taken to reduce upstream flow by cutting crude charge rate and temporarily stopping cooling tower blowdown.

Stormwater samples had been collected the preceding night around 2AM when rainfall began, and were routinely collected in the morning at 7AM. Samples were again collected immediately after the bypass began, at 9AM. Results for all samples are shown below.

Date, Time	pH	COD (mg/l)	Oil & Grease (mg/l)	TSS (mg/l)
5/21/13, 2AM	7.58	38.4	<1.4	322
5/21/13, 7AM	7.68	47.0	<1.4	393
5/21/13, 9AM (with bypass)	8.17	39.3	3.2	371
Outfall 002 limits:	6.5-9.0	120	15.0	Report

As shown by the above data, bulk discharge during the bypass did not exceed outfall 002 limits and was not substantially different than the discharge under non-bypass conditions.

We estimate that less than one barrel of free oil was associated with the 5/21 bypass events. Our stormwater ditch is equipped with an underflow weir and hay bales along its top; most oil was collected at the weir and did not reach outfall 002 shortly downstream. However, a thin oil film approximately 1 foot wide was present about a mile downstream of our facility, which was reported to the National Response Center. When the bypass occurred, vacuum trucks, sorbent materials and booms and additional outside response assistance were immediately deployed.

5/23/13 Wastewater Treatment System Bypass
On 5/23/13, the refinery experienced another very heavy and intense rainfall. Although the rainfall total was about one inch, this amount of rain occurred within a span of about 10 minutes, so all the rain essentially became runoff volume. Our stormwater flowment showed a total flow of over 5.9 million gallons for 5/23. In the wake of the 5/21 event, there was little available space for additional stormwater in our system. Bypass occurred intermittently during a fifteen-minute period between 10:00 and 10:15 AM on 5/23 as the combined process/stormwater channel overflowed into the stormwater ditch between pumping intervals of our stormwater diversion sump. Response and cleanup personnel with sorbents, booms and vacuum trucks were already on scene doing cleanup activities from the previous event. No free oil or sheen escaped refinery property. The additional wastewater treatment system pumping capacity was still in operation and continues to operate to reduce our wastewater inventory.

5/23/13 Surface Impoundment F04 Bypass
Following the two heavy deluge events on 5/21 and 5/23, one of our stormwater impoundments, F04 near the north end of our property, had overflowed on to the adjoining road. Due to construction activities in the area, this road was the only quick access to our firewater pumps in the event of an emergency. Water in the road was pickup truck grill high. The road flooding also prohibited operator access to one of our flares and some of its associated controls. Stormwater from this impoundment is normally pumped to our wastewater treatment system as stormwater inventory is worked off. A portable pump was used to pump the impoundment contents to an area of refinery property just west of the impoundment, beginning around 2:15 PM on 5/23. The surface drainage of the area is toward the west, eventually leaving the plant property along the western border of refinery property at our truck loading facility. The pump was left in operation until the flooded refinery road conditions had been alleviated, then shut off sometime during the night. The pump was not in operation at 7:30 AM on 5/24, and no discharge was observed at the west side of the refinery property at that time. It is unknown whether or not any discharge actually occurred, or if all the impoundment contents remained on refinery property.

If you have questions or need additional information, please call me at (405) 665-6601.

Sincerely yours,

Sidney Cabbiness
Wynnewood Refining Company, LLC

cc: Mark Manwell, Ada DEQ Office

DEQ

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

SELF REPORTING WASTEWATER BYPASS FORM

(TO BE SUBMITTED WITHIN 5 DAYS OF OCCURRENCE)

Date: 5/23/13 DEQ Facility ID # S# or I# - 25000220

Facility Name: Wynnewood Refining Company, LLC

Report All Bypasses to the DEQ Within 24 hours to: **1-800-256-2365**

Mail Written Report Within 5 Days To: Department of Environmental Quality
Water Quality Division
P.O. Box 1677
Oklahoma City, OK 73101-1677

DEQ notified within 24 hours of Bypass on: Date: 5/21/13

Notified Cheryl Dirck, ODEQ WQD Time: 8:50 AM

Type of Bypass:

☐ Pipe ☐ Clarifier / Filter ☐ Lagoon / Basin ☐ Manhole
☐ API Separator ☐ Head Works ☐ Drying Beds ☐ Batch Reactor
☐ Lift Station ☐ Digester X Other (specify) Open channel just upstream of API separator

Period of Bypass~ From 5 (Month) 21 (Day) 2013 (Year) 8:45 to 9:30 X AM ☐ PM
To 5 (Month) 21 (Day) 2013 (Year) 12:30 to 2:45 ☐ AM X PM Intermittently

Strength of Bypass: X Raw ☐ Partially Treated Amount of Bypass: unknown gallons

Were fish or other wildlife affected as a result of the bypass? ☐ Yes X No (If Yes, complete DEQ Form 605-001)

Type of Samples Taken: ☐ BOD X TSS X O&G X pH ☐ DO ☐ None X Other COD
pH 8.17 COD 39.3 mg/l O&G 3.2 mg/l TSS 371 mg/l

Geographical Location of Bypass (including Outfall Number or receiving stream if appropriate) Outfall 002, to unnamed tributary of Turkey Sandy Creek, Lat N 34 deg 37' 21.19" Long. W 97 deg 11' 57.21", NW ¼ NE ¼ NE ¼ S28 T2N R1EIM

Reason for Bypass: Heavy downpour following previous rainfall filled wastewater system to capacity. Open channel of combined process/storm sewer overflowed into stormwater ditch which conveys to outfall 002

Steps taken to prevent recurrence: Processing inventory as quickly as treatment plant will allow (within discharge limitations); deployed additional pump capacity (portable pumps) at treatment system to help process surge in wastewater inventory

Impact to receiving stream and/or surrounding areas: None following event. No oily residues on vegetation at downstream end of plant property following incident. Receiving stream is normally a dry channel.

Steps taken to clean up or treat Bypass: Underflow weir and hay bales present just upstream of outfall 002 contained most oil. Deployed booms, sorbents, and vac trucks at outfall 002 and at mouth of Turkey Sandy Creek, where a thin oil film approx. 1' wide was present during bypass event. Following event, collected/removed oil & residues at underflow weir and outfall 002 area.

Reported by: Sidney Cabbiness Title: Environmental Manager

Signature: Sidney Cabbiness Date: 5/28/13

Include copies of ANY test results.

ᶦc:. FC;1•1⁰HØIV.1 atiN
DEPARTMENT;OPIENVIRONMENTAIALIAtITY

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

SELF REPORTING WASTEWATER BYPASS FORM

(TO BE SUBMITTED WITHIN 5 DAYS OF OCCURRENCE)

Date: 5/24/13 DEQ Facility ID # S# or I# - 25000220

Facility Name: Wynnewood Refining Company, LLC

Report All Bypasses to the DEQ Within 24 hours to: **1-800-256-2365**

Mail Written Report Within 5 Days To: Department of Environmental Quality
Water Quality Division
P.O. Box 1677
Oklahoma City, OK 73101-1677

DEQ notified within 24 hours of Bypass on: Date: 5/24/13

Time: 8:03 AM to Cheryl Dirck via email

Type of Bypass:
☐ Pipe ☐ Clarifier / Filter ☐ Lagoon / Basin ☐ Manhole
☐ API Separator ☐ Head Works ☐ Drying Beds ☐ Batch Reactor
☐ Lift Station ☐ Digester X Other (specify) Open channel just upstream of API separator

Period of Bypass~ From 5 (Month) 23 (Day) 2013 (Year) 10:00 X AM ☐ PM
To 5 (Month) 23 (Day) 2013 (Year) 10:15 X AM PM Intermittently

Strength of Bypass: X Raw ☐ Partially Treated Amount of Bypass: unknown gallons

Were fish or other wildlife affected as a result of the bypass? ☐ Yes X No (If Yes, complete DEQ Form 605-001)

Type of Samples Taken: ☐ BOD TSS O&G pH ☐ DO X None Other

Geographical Location of Bypass (including Outfall Number or receiving stream if appropriate) Outfall 002, to unnamed tributary of Turkey Sandy Creek, Lat N 34 deg 37' 21.19" Long. W 97 deg 11' 57.21", NW ¼ NE ¼ NE ¼ S28 T2N R1EIM

Reason for Bypass: Heavy downpour following previous rainfall filled wastewater system to capacity. Open channel of combined process/storm sewer overflowed into stormwater ditch which conveys to outfall 002

Steps taken to prevent recurrence: Processing inventory as quickly as treatment plant will allow (within discharge limitations); deployed additional pump capacity (portable pumps) at treatment system to help process surge in wastewater inventory

Impact to receiving stream and/or surrounding areas: None following event. No oily residues on vegetation at downstream end of plant property following incident. Receiving stream is normally a dry channel.

Steps taken to clean up or treat Bypass: Underflow weir and hay bales present just upstream of outfall 002 contained most oil. Deployed booms, sorbents, and vac trucks at outfall 002. Following event, collected/removed oil & residues at underflow weir and outfall 002 area.

Reported by: Sidney Cabbiness Title: Environmental Manager

Signature: Sidney Cabbiness Date: 5/28/13

Include copies of ANY test results.

DEPARTMENT OF ENVIRONMENTAL QUALITY

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

SELF REPORTING WASTEWATER BYPASS FORM

(TO BE SUBMITTED WITHIN 5 DAYS OF OCCURRENCE)

Date: 5/24/13 DEQ Facility ID # S# or I# - 25000220

Facility Name: Wynnewood Refining Company, LLC

Report All Bypasses to the DEQ Within 24 hours to: **1-800-256-2365**

Mail Written Report Within 5 Days To: Department of Environmental Quality
Water Quality Division
P.O. Box 1677
Oklahoma City, OK 73101-1677

DEQ notified within 24 hours of Bypass on: Date: 5/24/13

Time: 10:42 AM to Cheryl Dirck via email

Type of Bypass: ☐ Pipe ☐ Clarifier / Filter ☐ Lagoon / Basin ☐ Manhole ☐ API Separator ☐ Head Works ☐ Drying Beds ☐ Batch Reactor ☐ Lift Station ☐ Digester X Other (specify) Permitted stormwater impoundment F04

Period of Bypass~ From 5 (Month) 23 (Day) 2013 (Year) 2:15 ☐ AM X PM

To 5 (Month) 24 (Day) 2013 (Year) unknown; before 7:30AM ☐ AM ☐ PM

Strength of Bypass: ☐ Raw ☐ Partially Treated Amount of Bypass: unknown gallons

Were fish or other wildlife affected as a result of the bypass? ☐ Yes X No (If Yes, complete DEQ Form 605-001)

Type of Samples Taken: ☐ BOD ☐ TSS ☐ O&G ☐ pH ☐ DO X None ☐ Other

Geographical Location of Bypass (including Outfall Number or receiving stream if appropriate) impoundment F04, stormwater runoff impoundment near west end of warehouse/alky area, NE ¼ SW ¼ NW1/4 S23 T2N R1EIM

Reason for Bypass: Impoundment flooded adjacent road and blocked access to emergency firewater pumps. Pumped impoundment contents to refinery property west of impoundment. The stormwater may or may not have discharged from there to west edge of refinery property at product loading facility area

Steps taken to prevent recurrence: impoundment was pumped until flooded road had been cleared (discharge was minimized; did not empty impoundment). Purpose of impoundment is to collect stormwater runoff.

Impact to receiving stream and/or surrounding areas: None

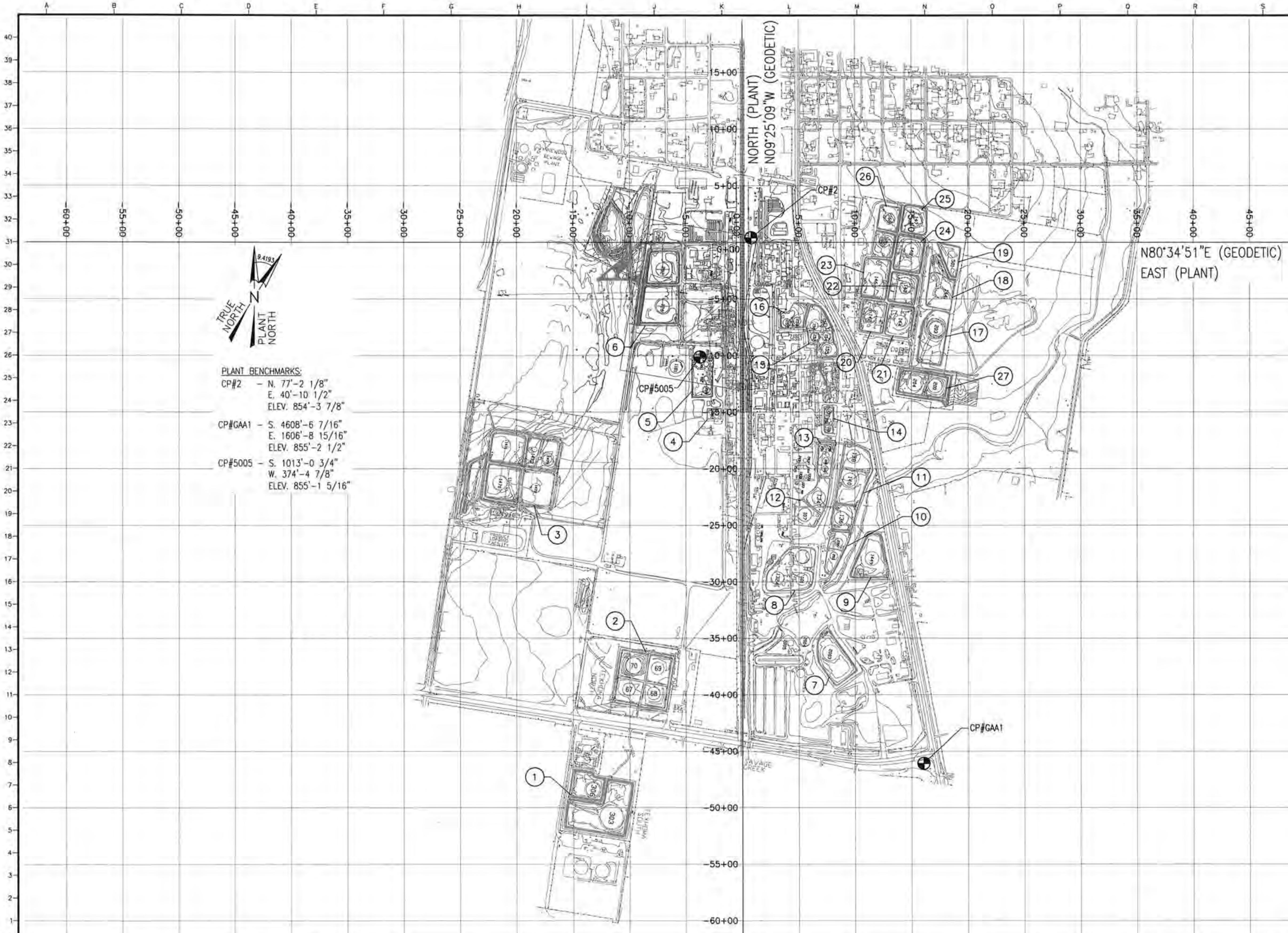
Steps taken to clean up or treat Bypass: Not applicable; stormwater only

Reported by: Sidney Cabbiness Title: Environmental Manager

Signature: Sidney Cabbiness Date: 5/28/13

Include copies of ANY test results.

Appendix L
Sufficient Freeboard Determination



PLANT BENCHMARKS:

CP#2 – N. 77'-2 1/8"
E. 40'-10 1/2"
ELEV. 854'-3 7/8"

CP#GAA1 – S. 4608'-6 7/16"
E. 1606'-8 15/16"
ELEV. 855'-2 1/2"

CP#5005 – S. 1013'-0 3/4"
W. 374'-4 7/8"
ELEV. 855'-1 5/16"

LEGENDS / ABBREVIATIONS

BENCH MARK, CONTROL POINT OR CONSTRUCTION POINT
PT# GABXXX / CP#XXX SURVEY POINT/CONTROL POINT NUMBER

1. CONTAINMENT FOR T-303 & T-306
2. CONTAINMENT FOR T-67, T-68, T-69 & T-70
3. CONTAINMENT FOR T-1470, T-1471, T-1472, T-1473 & T-1475
4. CONTAINMENT FOR T-2007
5. CONTAINMENT FOR T-951, T-953 & T-2051
6. CONTAINMENT FOR T-126 & T-202
7. CONTAINMENT FOR T-2003
8. CONTAINMENT FOR T-101 & T-1324
9. CONTAINMENT FOR T-1449
10. CONTAINMENT FOR T-252 & T-253
11. CONTAINMENT FOR T-136, T-138 & T-140
12. CONTAINMENT FOR T-107 & T-134
13. CONTAINMENT FOR T-108, T-110, T-250 & T-251
14. CONTAINMENT FOR T-111, T-256 & T-257
15. CONTAINMENT FOR T-150, T-152, T-154, T-155 & T-156
16. CONTAINMENT FOR T-254 & T-255
17. CONTAINMENT FOR T-203
18. CONTAINMENT FOR T-1441
19. CONTAINMENT FOR T-501
20. CONTAINMENT FOR T-142
21. CONTAINMENT FOR T-144
22. CONTAINMENT FOR T-143
23. CONTAINMENT FOR T-146 & T-164
24. CONTAINMENT FOR T-148
25. CONTAINMENT FOR T-147
26. CONTAINMENT FOR T-168
27. CONTAINMENT FOR T-200 & T-204

ISSUED FOR JANUARY 15, 2014 CONSTRUCTION

ENGlobal U.S., Inc. Oklahoma CA #5520 PE/LS Renewal Date 06/30/14

REFERENCE DRAWINGS

GENERAL NOTES:

WYNNEWOOD REFINERY

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUED FOR CONSTRUCTION	10-121499	TC	1-15-14	JL	HJB	MR

ENGlobal® TULSA, OKLAHOMA
10-121499 ENGLOBAL PROJECT NO

TANK CONTAINMENT
CALCULATIONS & RECOMMENDATIONS
LOCATION PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OKLAHOMA

DESIGNED BY: H. BROWNSON	CHECKED BY: J. LISTER	DATE: 1-13-14
DRAWN BY: TC	APPROVED BY: M. ROGERS	SCALE: NONE
PROJECT NO.: 10-121499 (05)	DWG. NO. G-SK-1	

J:\10-112390 Wynnewood Small Projects\08.0 CAD Drawings\08.07 Civil\82-Tank Berm Capacities\Tank Containment Recommendations\G-SK-1.dwg Jan 14, 2014 - 10:05am tim.collins

CONSTRUCTION NOTES FOR REPAIR OF EXISTING DIKES

1. LOW AREAS TO RECEIVE FILL SHALL BE DRAINED SO THAT THEY ARE FREE OF STANDING WATER.
2. THE EXISTING DIKE SURFACE SHALL BE TESTED FOR MOISTURE CONTENT AND, IF DEFICIENT, SCARIFIED TO A DEPTH OF FOUR INCHES AND MOISTURE CONDITIONED TO WITHIN −2 TO +4 PERCENTAGE POINTS OF OPTIMUM MOISTURE AS DETERMINED BY MODIFIED PROCTOR ASTM D1557, OR STANDARD PROCTOR ASTM D698.
3. PRIOR TO PLACEMENT OF FILL, THE EXISTING DIKE SURFACE SHALL BE COMPACTED TO AT LEAST 90% OF THE MAXIMUM MODIFIED PROCTOR DENSITY, OR 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY. THE DENSITY OF THE TOP SIX INCHES IN AREAS OF FILL WHERE GRANULAR SOILS EXIST THAT DO NOT EXHIBIT WELL-DEFINED MOISTURE-DENSITY RELATIONSHIP, SHALL BE COMPACTED TO AT LEAST 80% RELATIVE DENSITY IN ACCORDANCE WITH ASTM D4253 AND ASTM D4254.
4. FILL MATERIAL SHALL BE INERT FROM ON-SITE EXCAVATION AND SHALL CONSIST OF CLAY, SILTY CLAY, OR SILTY SAND OR A MIXTURE OF THESE CONSTITUENTS. FILL MATERIAL SHALL HAVE A MAXIMUM LIQUID LIMIT OF 40, AND A PLASTICITY INDEX LESS THAN 17.
5. FILL SHALL BE PLACED IN LIFTS OF 8 INCHES (MAXIMUM) LOOSE DEPTH. FOR HAND-OPERATED COMPACTION EQUIPMENT, STRUCTURAL FILL MATERIALS SHALL BE PLACED IN LIFTS OF 4 INCHES (MAXIMUM) LOOSE DEPTH.
6. FILL SHALL BE COMPACTED TO AT LEAST 90% OF THE MAXIMUM MODIFIED PROCTOR DENSITY OR 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY.
7. MOISTURE CONTENT OF THE MATERIAL BEING COMPACTED SHALL BE WITHIN −2 TO +4 PERCENTAGE POINTS OF OPTIMUM MOISTURE AS DETERMINED BY MODIFIED PROCTOR ASTM D1557, OR STANDARD PROCTOR ASTM D698.
8. FIELD DENSITY TESTS SHALL BE PERFORMED USING THE NUCLEAR METHOD OR OTHER METHOD APPROVED BY THE OWNER, TO DETERMINE THE MOISTURE CONTENT AND PERCENT COMPACTION OF THE DIKE MATERIALS. IN-PLACE DENSITY TESTS SHALL BE TAKEN EVERY 100 FEET OR FRACTION THEREOF FOR EACH LIFT OF MATERIAL PLACED.
9. COMPACTED DIKE SURFACES SHALL BE LEVEL AND FINISH-GRADED AS SPECIFIED ON THE CONSTRUCTION DRAWINGS. COAT ALL SURFACES WITH EMULSIFIED ASPHALT TO PROTECT AGAINST EROSION. THE EMULSIFIED ASPHALT MAY BE SUBSTITUTED WITH COMPACTED GRAVEL FOR SURFACES INTENDED FOR VEHICULAR TRAFFIC.

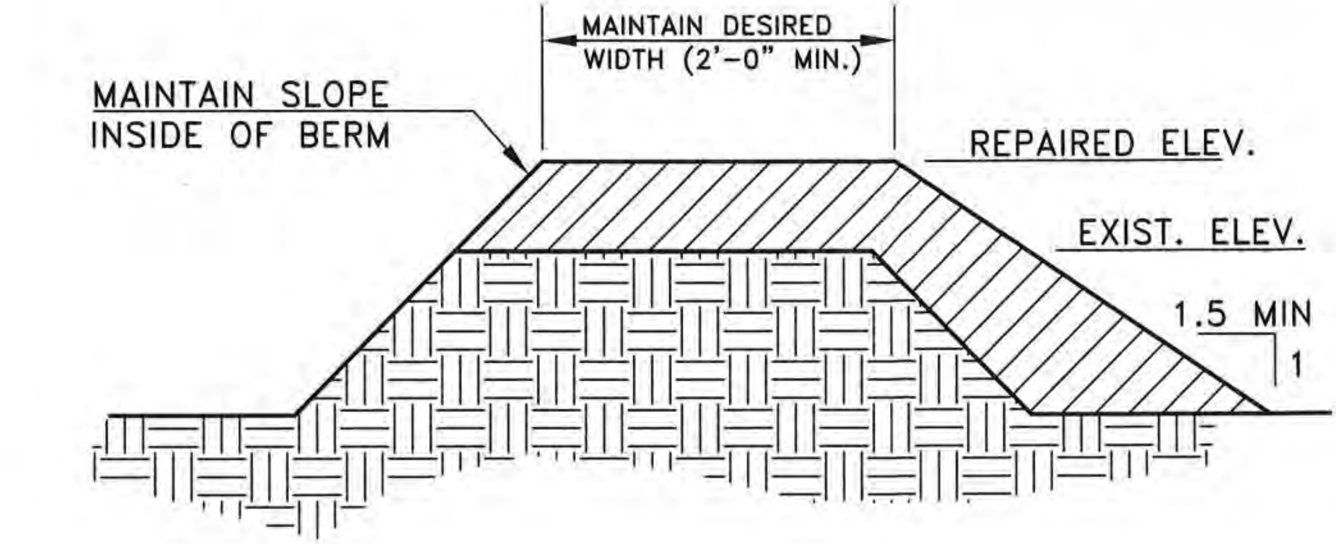
ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

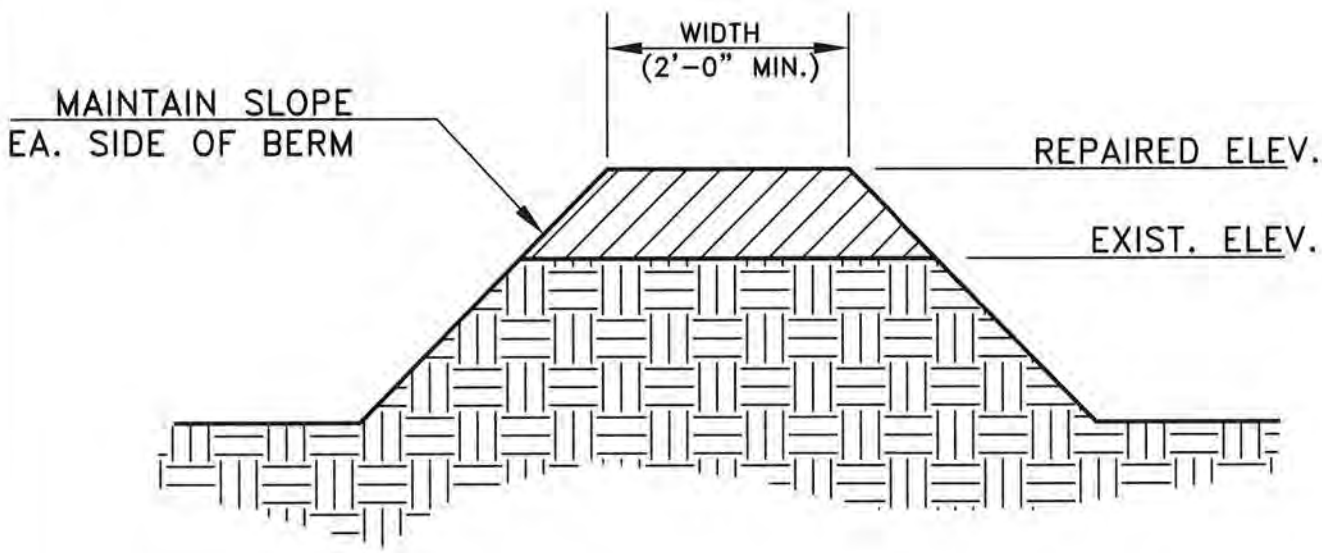
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	G-SK-2
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	



1. EXTERIOR BERM REPAIR DIAGRAM



2. INTERIOR BERM REPAIR DIAGRAM

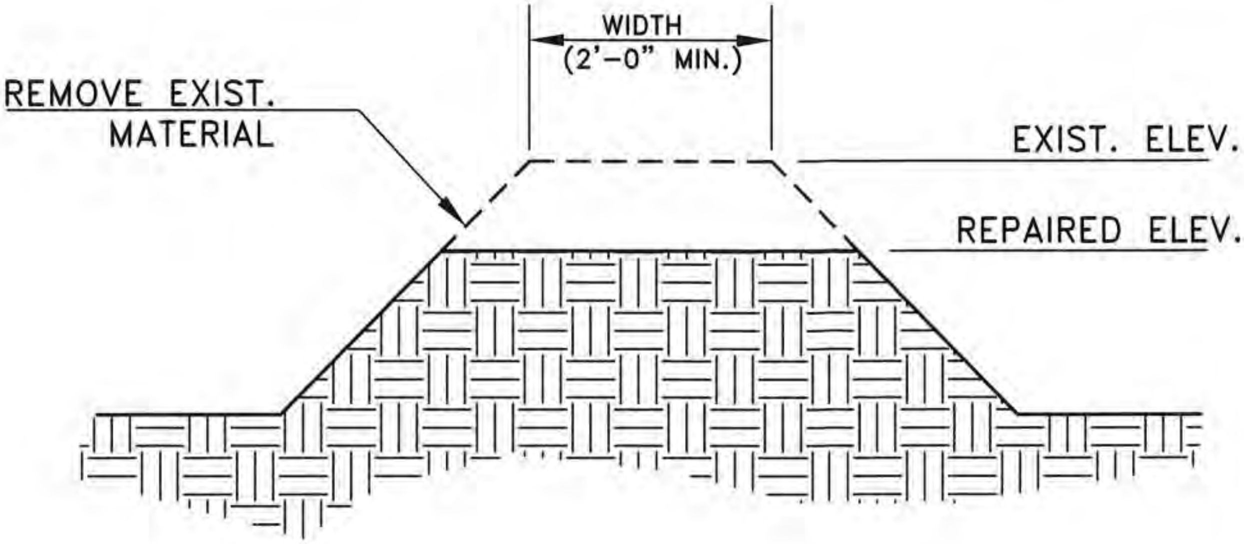
ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-3
WYNNEWOOD, OK	CHK. HJB	SCALE: NONE	CAD SAVE NAME: ----	



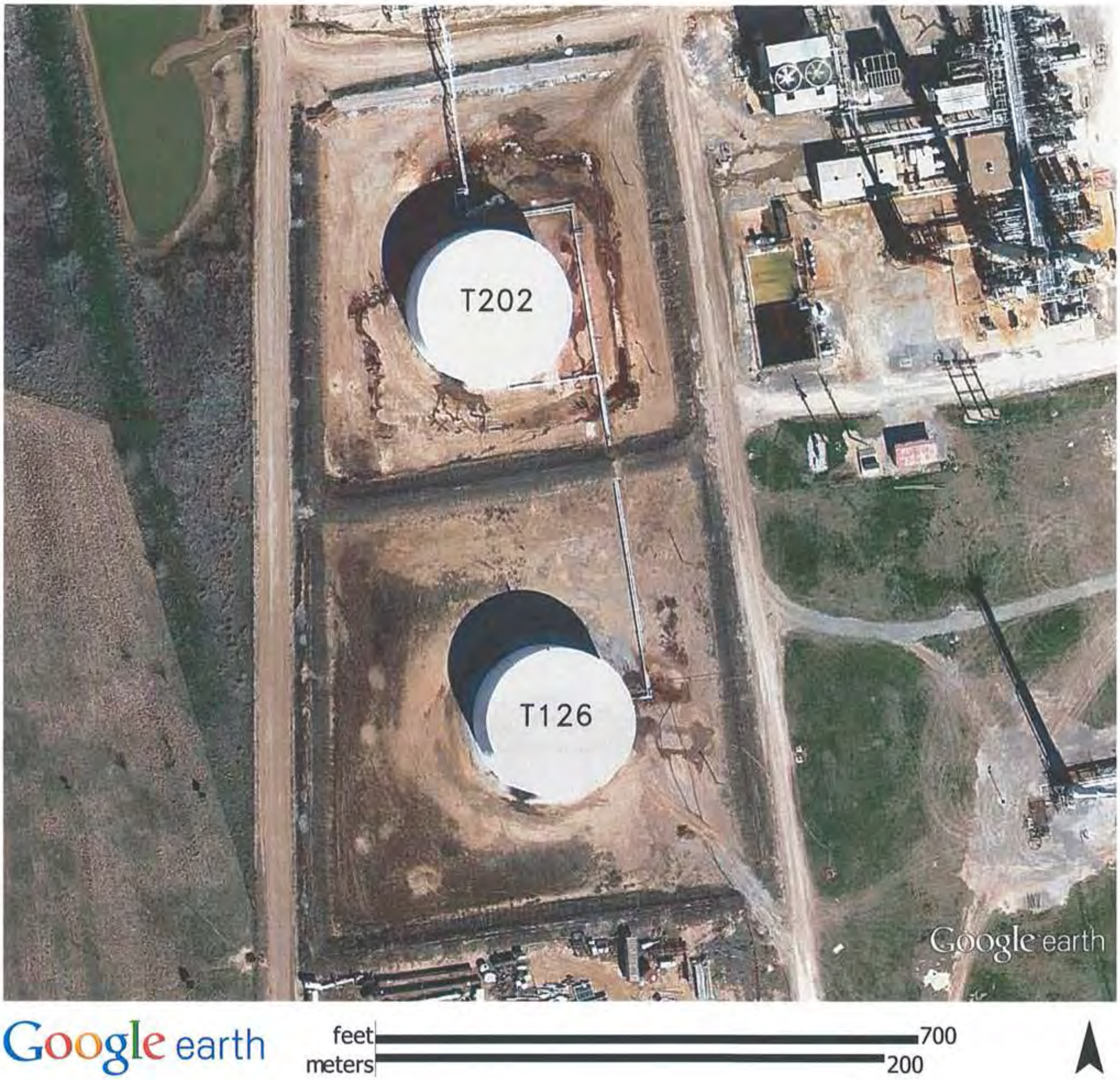
3. INTERIOR BERM REPAIR DIAGRAM

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR: WYNNEWOOD REFINERY	DWN. HJB	DATE: 1/15/14	PROJECT NO: 10–112390	DWG. NO. SK–4
WYNNEWOOD, OK	CHK. HJB	SCALE: NONE	CAD SAVE NAME: ----	



TANKS T126, T202

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/9/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

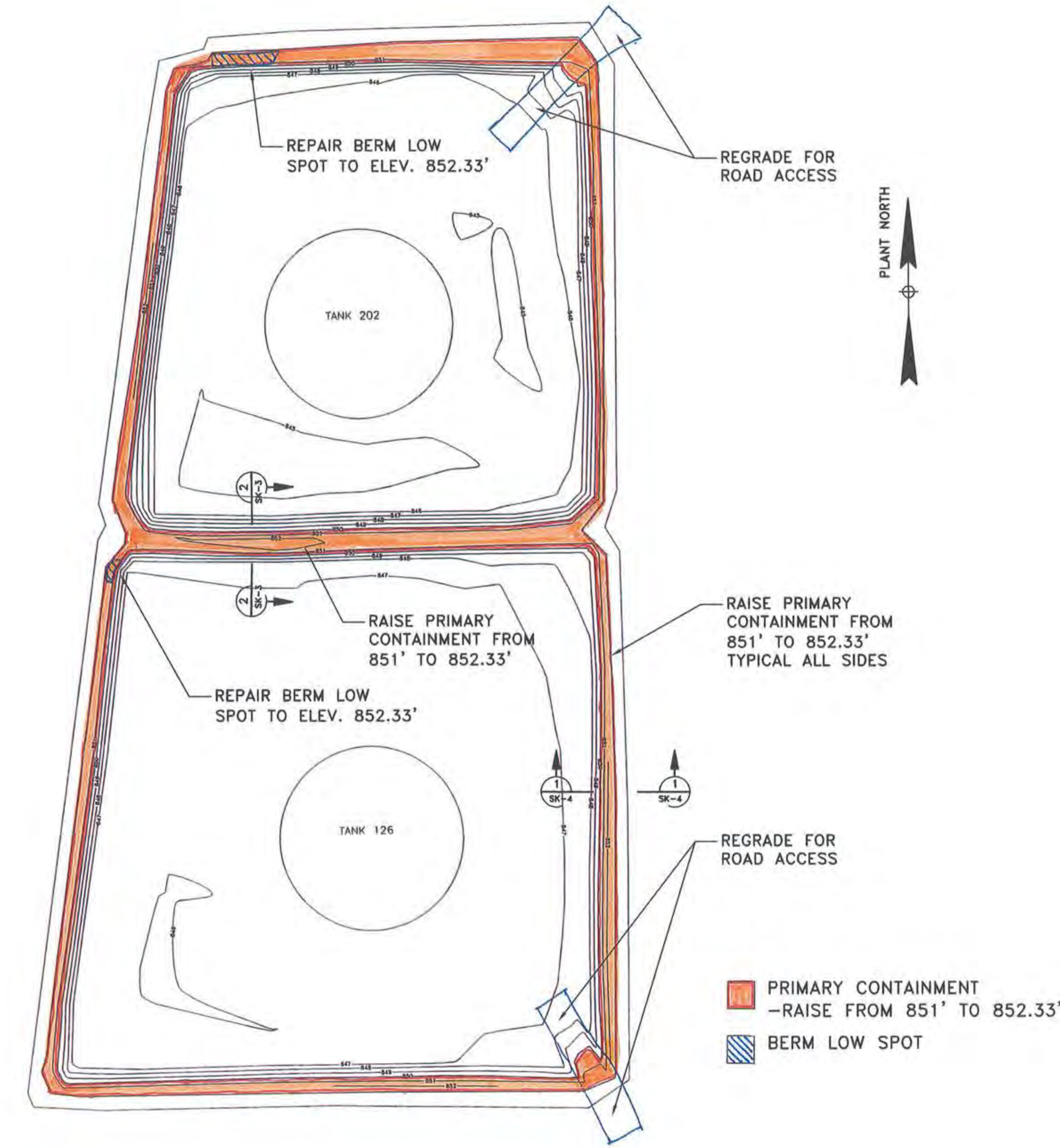
Tank Area - T126, T202

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
126	79,557	446,681	510,858	850.00	307,502	852.33	515,759	**2.33**
202	80,603	452,554	500,798	850.00	315,218	852.33	505,201	**2.33**

Recommendations:

1. Raise primary berm (shown in orange) to required elevation = 852.33'.
2. Re-grade road entrance areas to access final berm elevations.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL.

FOR:

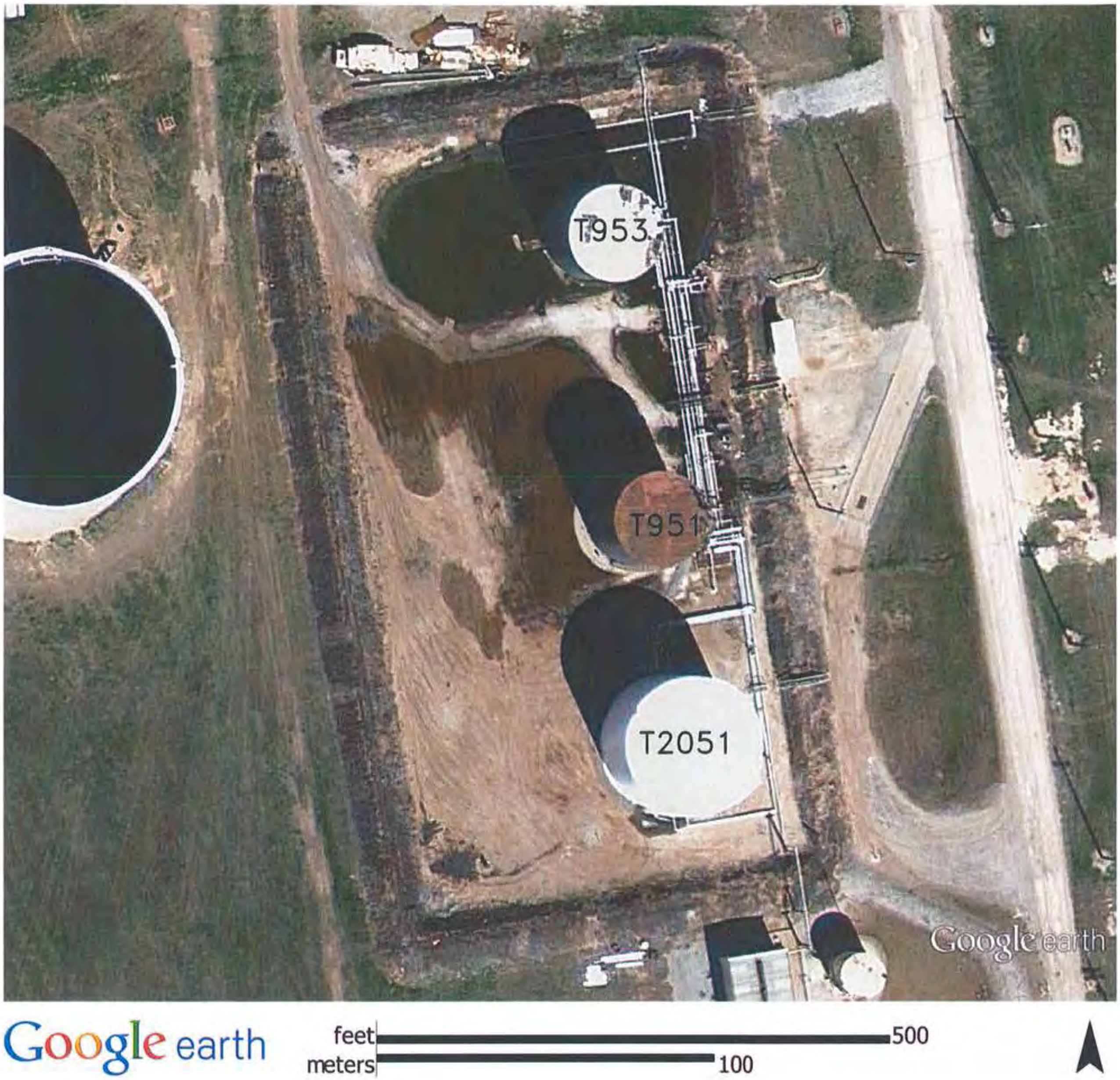
NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	APPROVAL ENG.	APPROVAL PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO.	SK-2



TANKS T951, T953, T2051

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/14/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

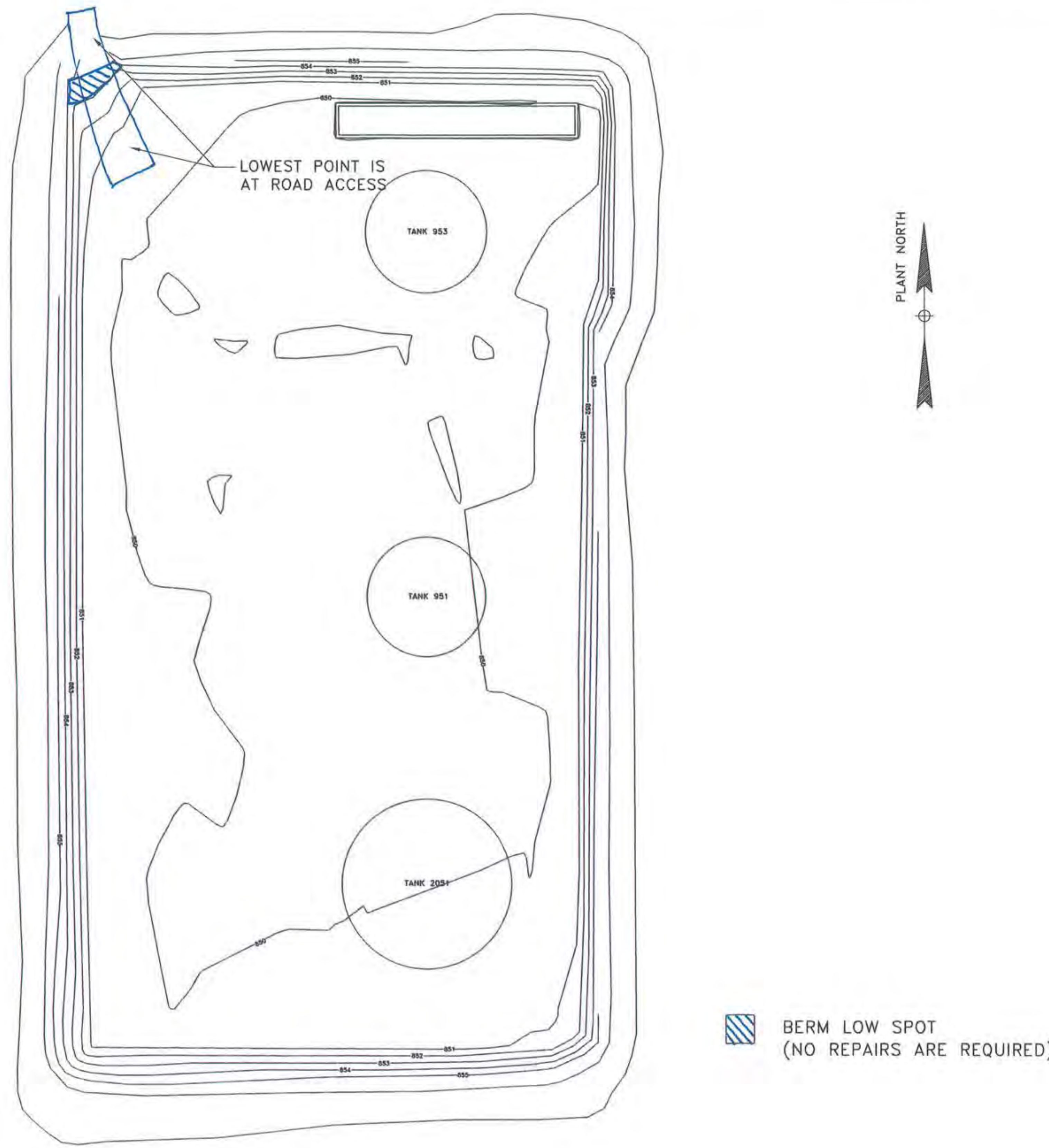
Tank Area - T951, T953, T2051

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
2051	18,099	101,619	139,400	853.00	161,579	N/A	N/A	**N/A**

Recommendations:

1. No berm repairs are required



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL.

FOR:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	APPROVAL ENG.	APPROVAL PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO.	SK-2

TANK T2007

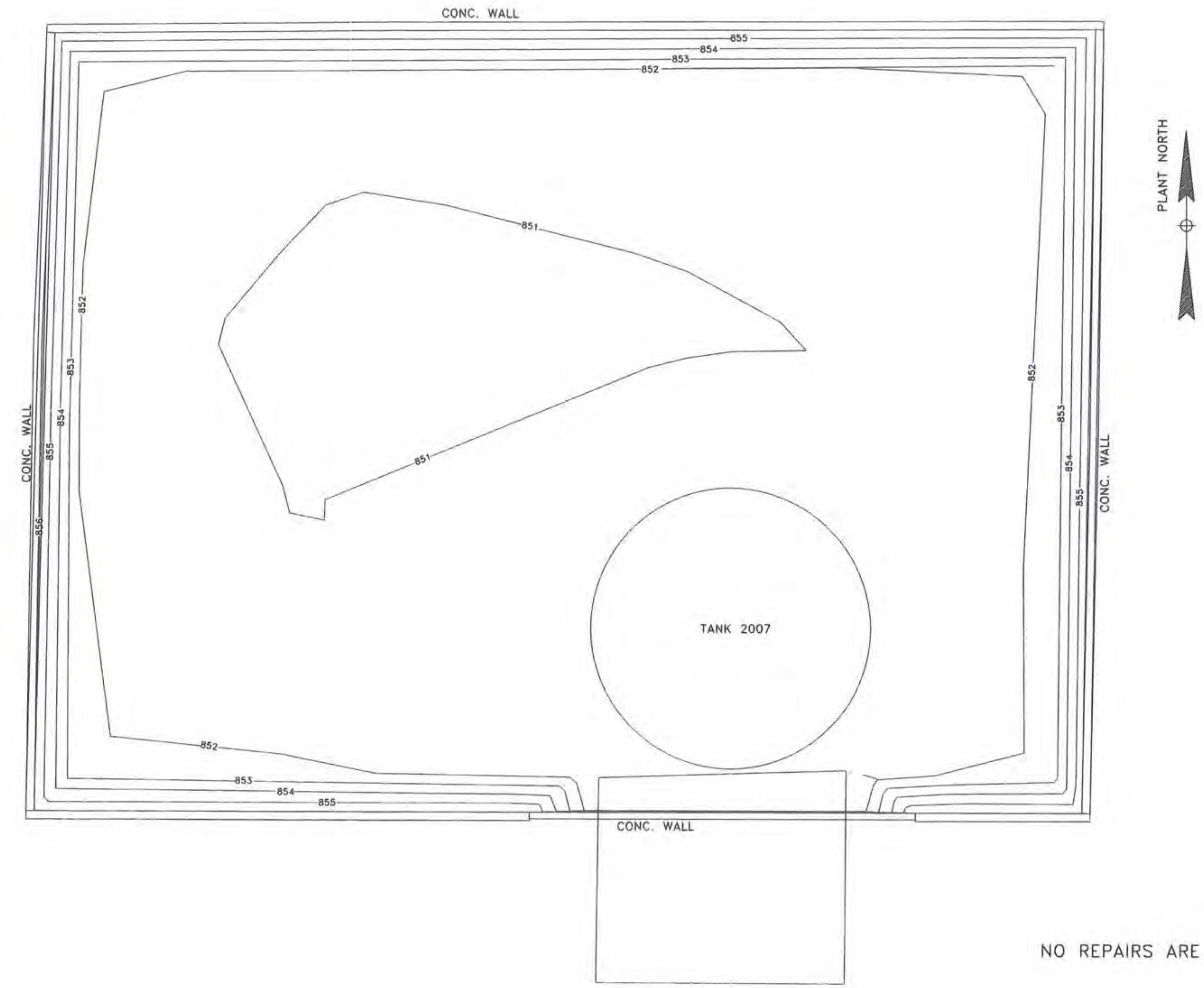
ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	



NO REPAIRS ARE REQUIRED

REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL.

FOR:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

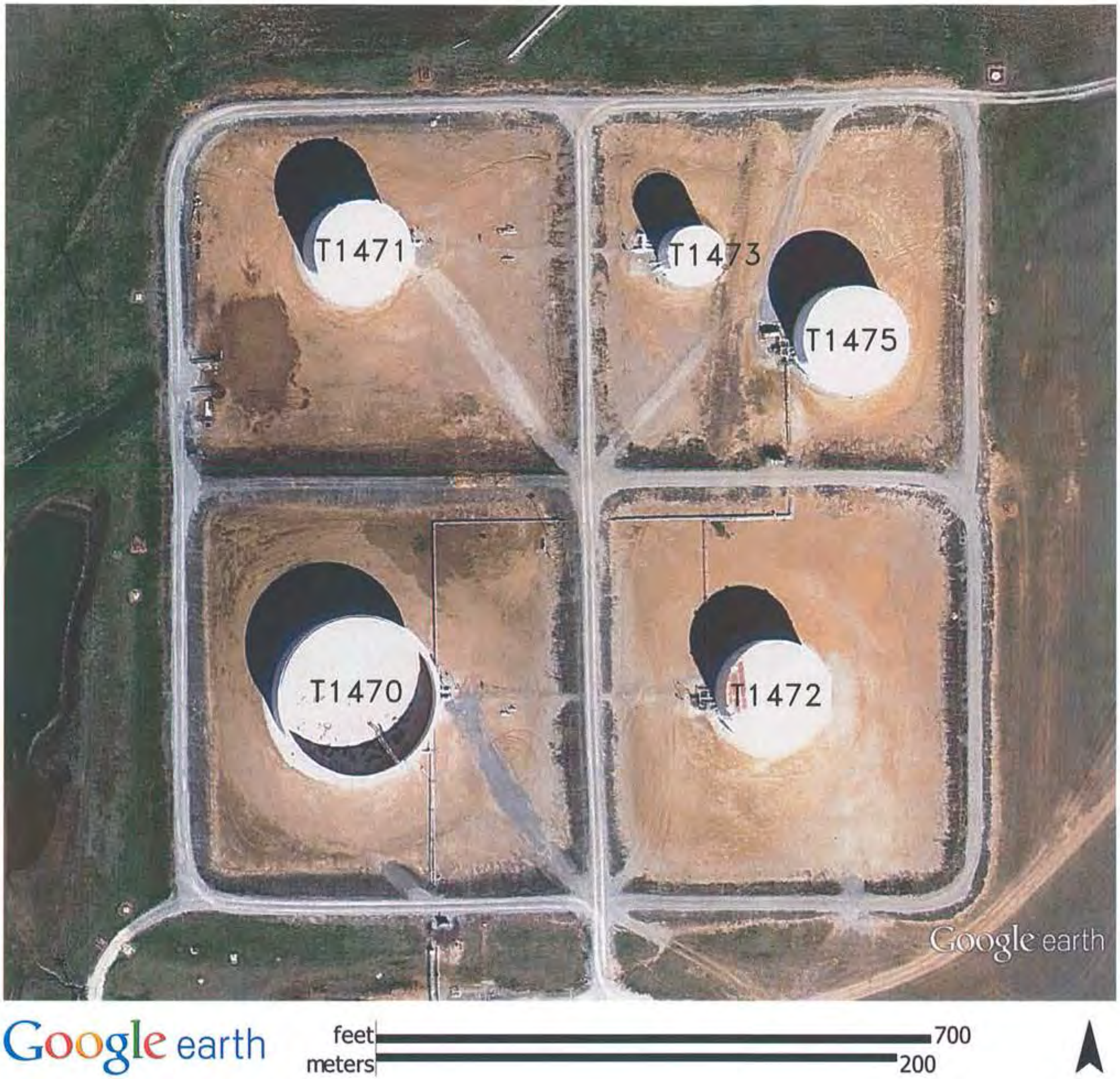
ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO.	SK-2



TANKS T1470, T1471, T1472, T1473, T1475

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	JOB NO.:	10-112390 (82)	SHEET:	1
LOCATION:	Wynnewood, Oklahoma	CALCS BY:	Zulfiquar Syed	DATE:	
SUBJECT:	Existing Tank Berm Capacities	CHECKED BY:	H.J. Brownson, P.E.	DATE:	12/14/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Area - T1470, T1471, T1472, T1473, T1475

Secondary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (10%) (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
1470	79,632	447,102	44,710	844.00	296,114	N/A	N/A	N/A
1471	34,848	195,658	19,566	839.00	147,998	N/A	N/A	N/A
1472	35,775	200,862	20,086	844.00	71,959	N/A	N/A	N/A
1473	9,614	53,979	5,398	841.00	28,512	N/A	N/A	N/A
1475	35,775	200,862	20,086	841.00	9,534	842.00	45,177	1.00

Primary Containment: Considering the containment areas for T1470 and 1471

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
1470	79,632	447,102	499,664	839.00	437,672	842.00	586,004	3.00

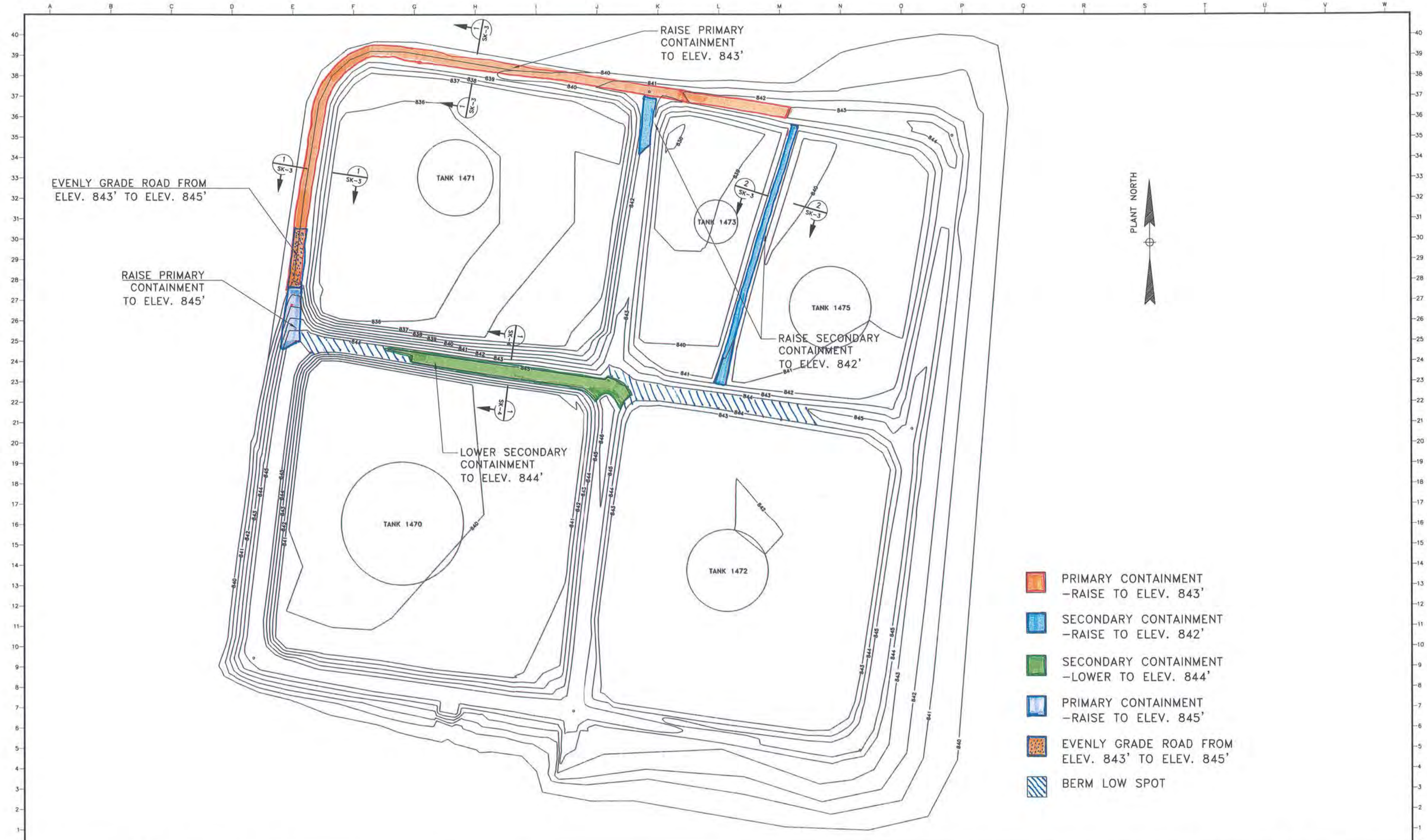
Primary Containment: Considering the containment area for T1471

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
1471	34,848	195,658	239,539	842.00	370,496	N/A	N/A	N/A

Tank T1472 - Primary containment is OK by inspection, comparing volumes to Tank T1470.

Tank T1473 - Primary containment is OK by inspection, comparing volumes to Tank T1471.

Tank T1475 - Primary containment is OK by inspection, using containment areas for T1473 and T1471.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS
SK-4	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL

FOR:

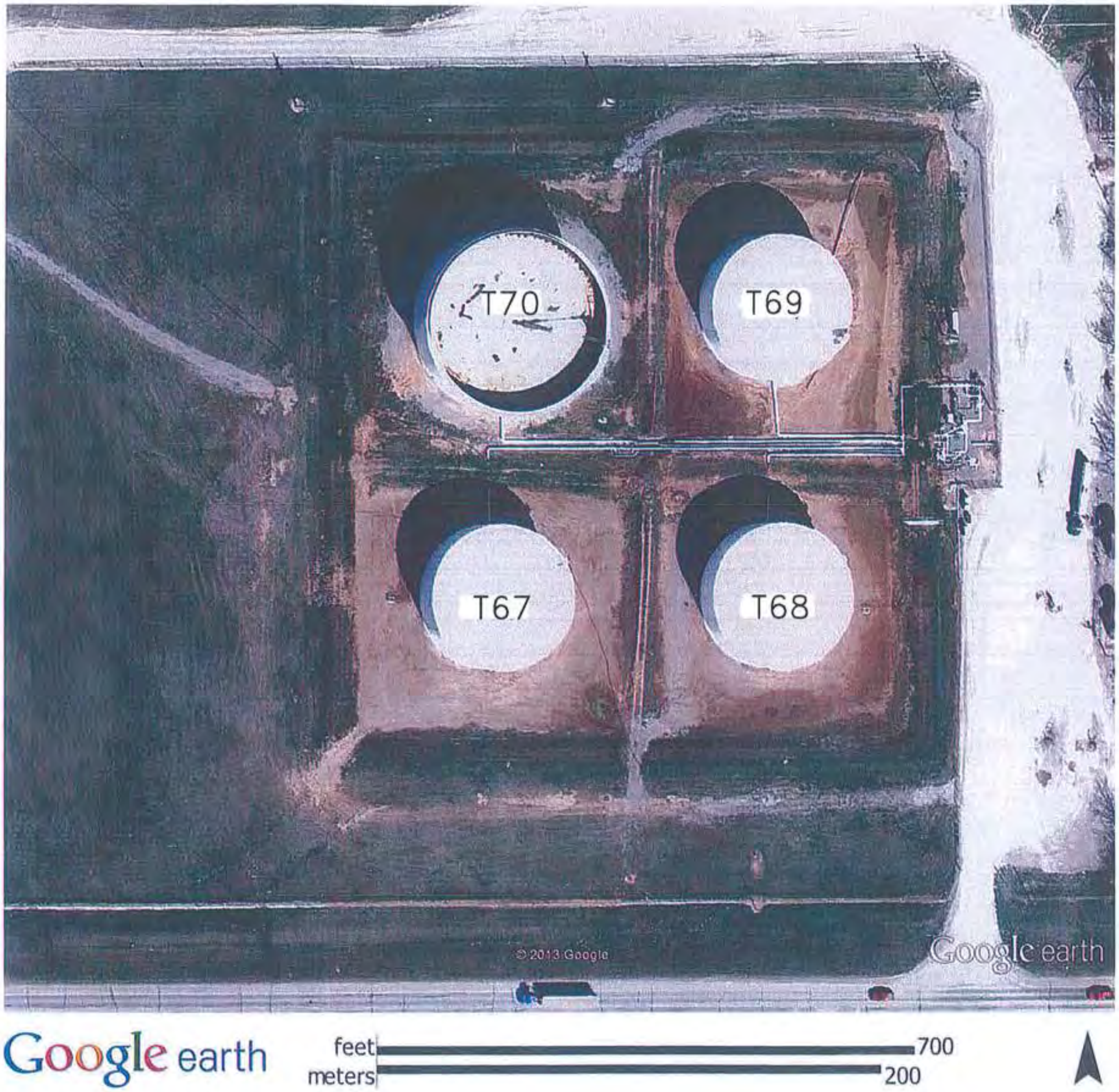
NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	



TANKS T67, T68, T69, T70

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR: WYNNEWOOD REFINERY	DWN. HJB	DATE: 11/21/13	PROJECT NO: 10-121399	DWG. NO. SK-1
WYNNEWOOD, OK	CHK. HJB	SCALE: NONE	CAD SAVE NAME: ----	

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-130450 (82)	**SHEET:**	1
LOCATION:	Wynnewood Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	9/24/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Area - T67, T86, T96, T70

Secondary Containment:

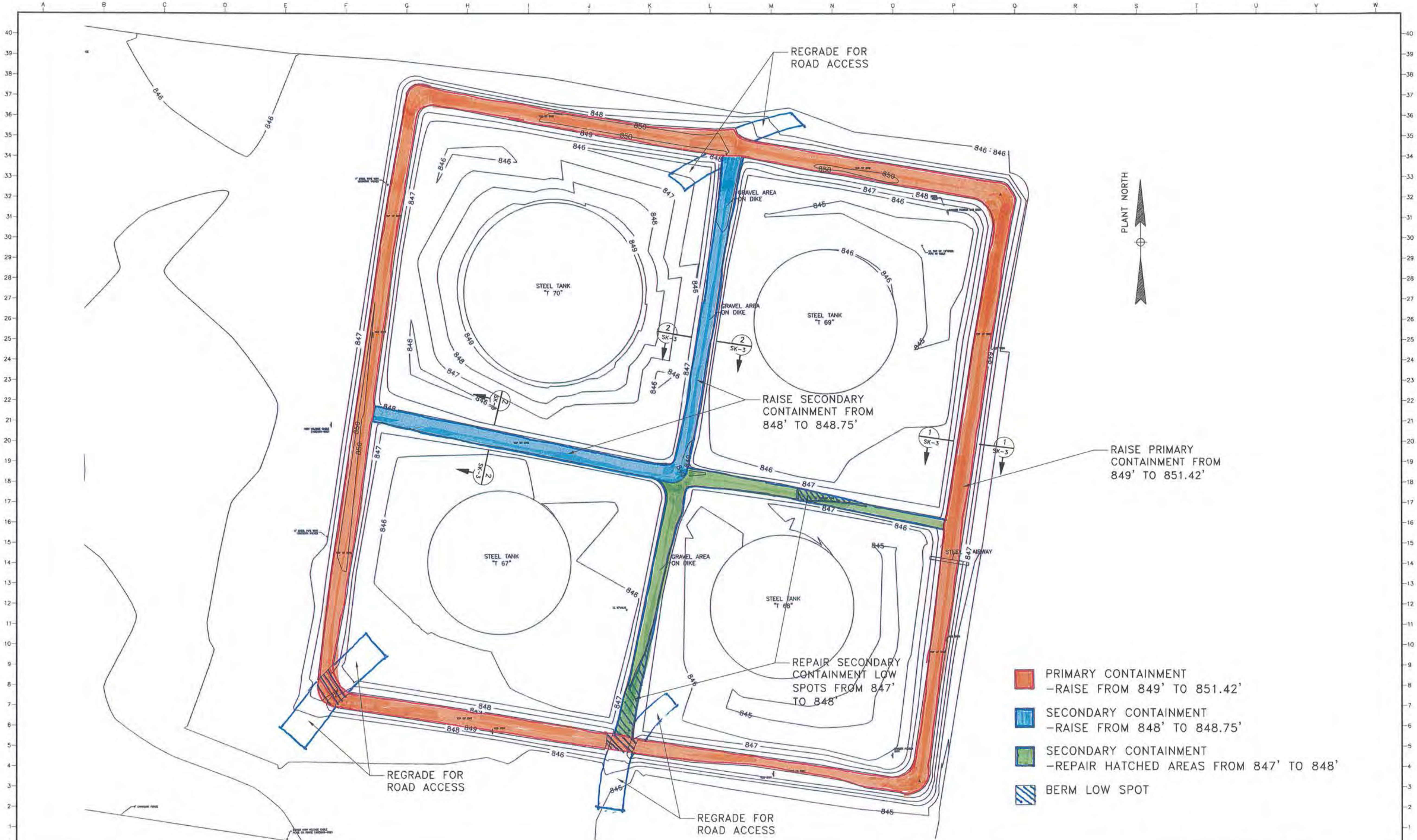
Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
67	68,901	386,852	38,685	847.00	35,976	848.00	53,514	**1.00**
68	68,853	386,582	38,658	847.00	32,622	848.00	64,399	**1.00**
69	68,897	386,829	38,683	847.00	39,392	848.00	77,840	**1.00**
70	137,078	769,638	76,964	848.00	35,103	848.75	85,530	**0.75**

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
70	137,078	769,638	892,721	849.00	395,019	851.42	898,444	**2.42**

Recommendations:

1. Repair low spots shown on secondary berms (shown in green) to required elevation = 848'.
2. Raise secondary berm (shown in blue) to required elevation = 848.75'.
3. Raise primary berm (shown in orange) to required elevation = 851.42'.
4. Re-grade road entrance areas to access final berm elevations.



REFERENCE DRAWINGS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL.

FOR:

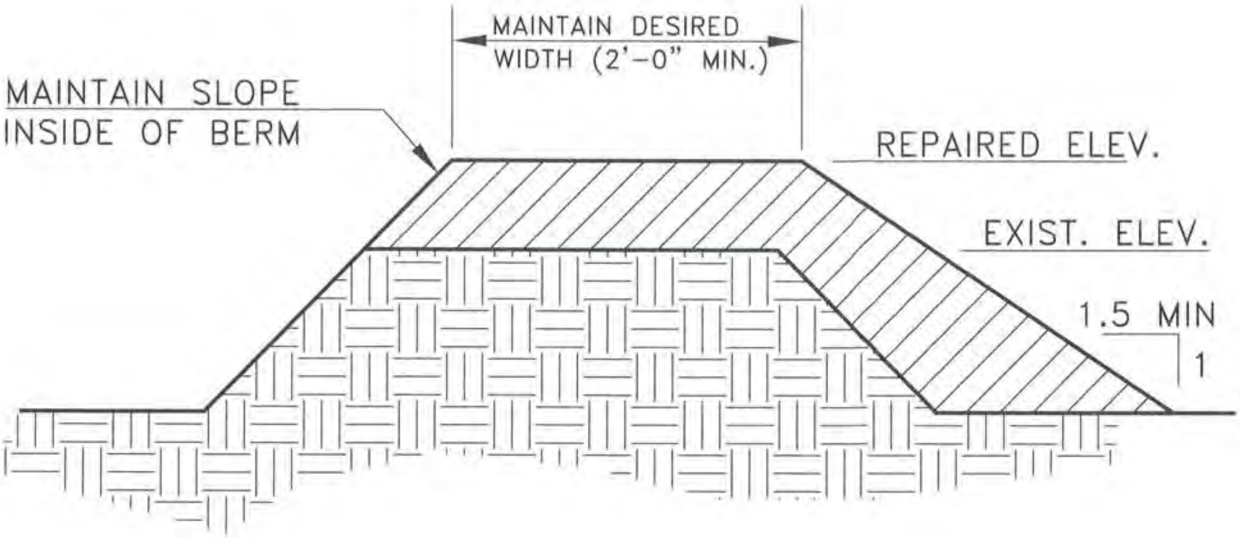
NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	11/21/13	HJB	HJB	MAR

ENGlobal
TULSA, OKLAHOMA

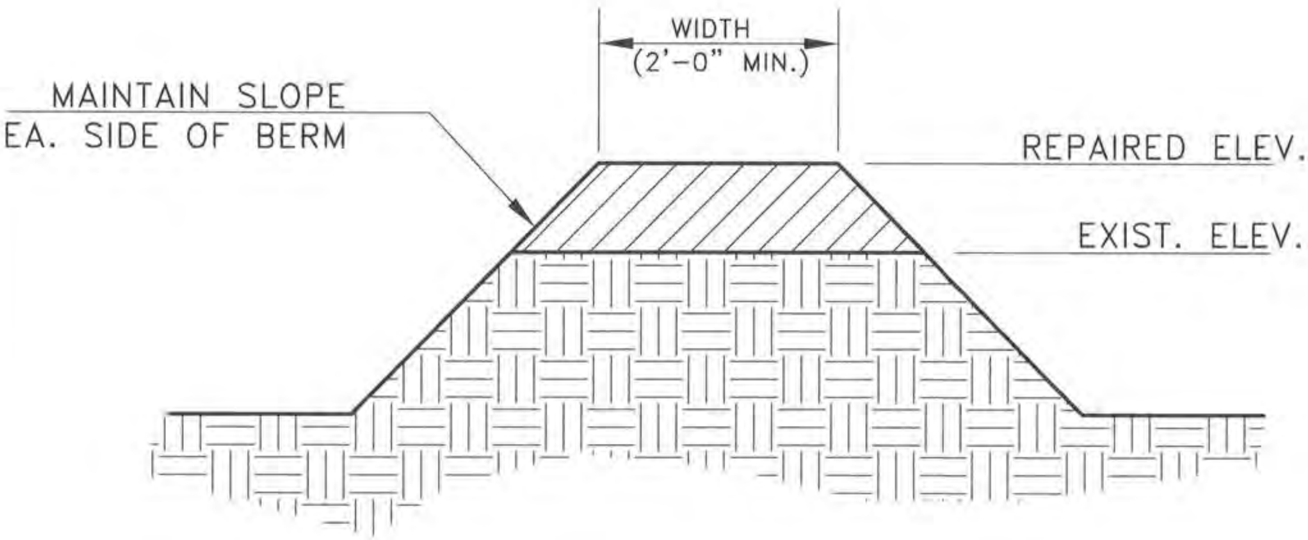
TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 11/21/13
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	



1. PRIMARY BERM REPAIR DIAGRAM



2. SECONDARY BERM REPAIR DIAGRAM

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR: WYNNEWOOD REFINERY	DWN: HJB	DATE: 11/21/13	PROJECT NO: 10-121399	DWG. NO. SK-3
WYNNEWOOD, OK	CHK: HJB	SCALE: NONE	CAD SAVE NAME: ----	

CONSTRUCTION NOTES FOR REPAIR OF EXISTING DIKES

1. LOW AREAS TO RECEIVE FILL SHALL BE DRAINED SO THAT THEY ARE FREE OF STANDING WATER.
2. THE EXISTING DIKE SURFACE SHALL BE TESTED FOR MOISTURE CONTENT AND, IF DEFICIENT, SCARIFIED TO A DEPTH OF FOUR INCHES AND MOISTURE CONDITIONED TO WITHIN -2 TO +4 PERCENTAGE POINTS OF OPTIMUM MOISTURE AS DETERMINED BY MODIFIED PROCTOR ASTM D1557, OR STANDARD PROCTOR ASTM D698.
3. PRIOR TO PLACEMENT OF FILL, THE EXISTING DIKE SURFACE SHALL BE COMPACTED TO AT LEAST 90% OF THE MAXIMUM MODIFIED PROCTOR DENSITY, OR 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY. THE DENSITY OF THE TOP SIX INCHES IN AREAS OF FILL WHERE GRANULAR SOILS EXIST THAT DO NOT EXHIBIT WELL-DEFINED MOISTURE-DENSITY RELATIONSHIP, SHALL BE COMPACTED TO AT LEAST 80% RELATIVE DENSITY IN ACCORDANCE WITH ASTM D4253 AND ASTM D4254.
4. FILL MATERIAL SHALL BE INERT FROM ON-SITE EXCAVATION AND SHALL CONSIST OF CLAY, SILTY CLAY, OR SILTY SAND OR A MIXTURE OF THESE CONSTITUENTS. FILL MATERIAL SHALL HAVE A MAXIMUM LIQUID LIMIT OF 40, AND A PLASTICITY INDEX LESS THAN 17.
5. FILL SHALL BE PLACED IN LIFTS OF 8 INCHES (MAXIMUM) LOOSE DEPTH. FOR HAND-OPERATED COMPACTION EQUIPMENT, STRUCTURAL FILL MATERIALS SHALL BE PLACED IN LIFTS OF 4 INCHES (MAXIMUM) LOOSE DEPTH.
6. FILL SHALL BE COMPACTED TO AT LEAST 90% OF THE MAXIMUM MODIFIED PROCTOR DENSITY OR 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY.
7. MOISTURE CONTENT OF THE MATERIAL BEING COMPACTED SHALL BE WITHIN -2 TO +4 PERCENTAGE POINTS OF OPTIMUM MOISTURE AS DETERMINED BY MODIFIED PROCTOR ASTM D1557, OR STANDARD PROCTOR ASTM D698.
8. FIELD DENSITY TESTS SHALL BE PERFORMED USING THE NUCLEAR METHOD OR OTHER METHOD APPROVED BY THE OWNER, TO DETERMINE THE MOISTURE CONTENT AND PERCENT COMPACTION OF THE DIKE MATERIALS. IN-PLACE DENSITY TESTS SHALL BE TAKEN EVERY 100 FEET OR FRACTION THEREOF FOR EACH LIFT OF MATERIAL PLACED.
9. COMPACTED DIKE SURFACES SHALL BE LEVEL AND FINISH-GRADED AS SPECIFIED ON THE CONSTRUCTION DRAWINGS. COAT ALL SURFACES WITH EMULSIFIED ASPHALT TO PROTECT AGAINST EROSION. THE EMULSIFIED ASPHALT MAY BE SUBSTITUTED WITH COMPACTED GRAVEL FOR SURFACES INTENDED FOR VEHICULAR TRAFFIC.

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	11/21/13	10-121399	SK-4
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

Google earth

feet 500
meters 100

TANKS T254, T255

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	JOB NO.:	10-112390 (82)	SHEET:	1
LOCATION:	Wynnewood, Oklahoma	CALCS BY:	Zulfiquar Syed	DATE:	
SUBJECT:	Existing Tank Berm Capacities	CHECKED BY:	H.J. Brownson, P.E.	DATE:	12/23/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

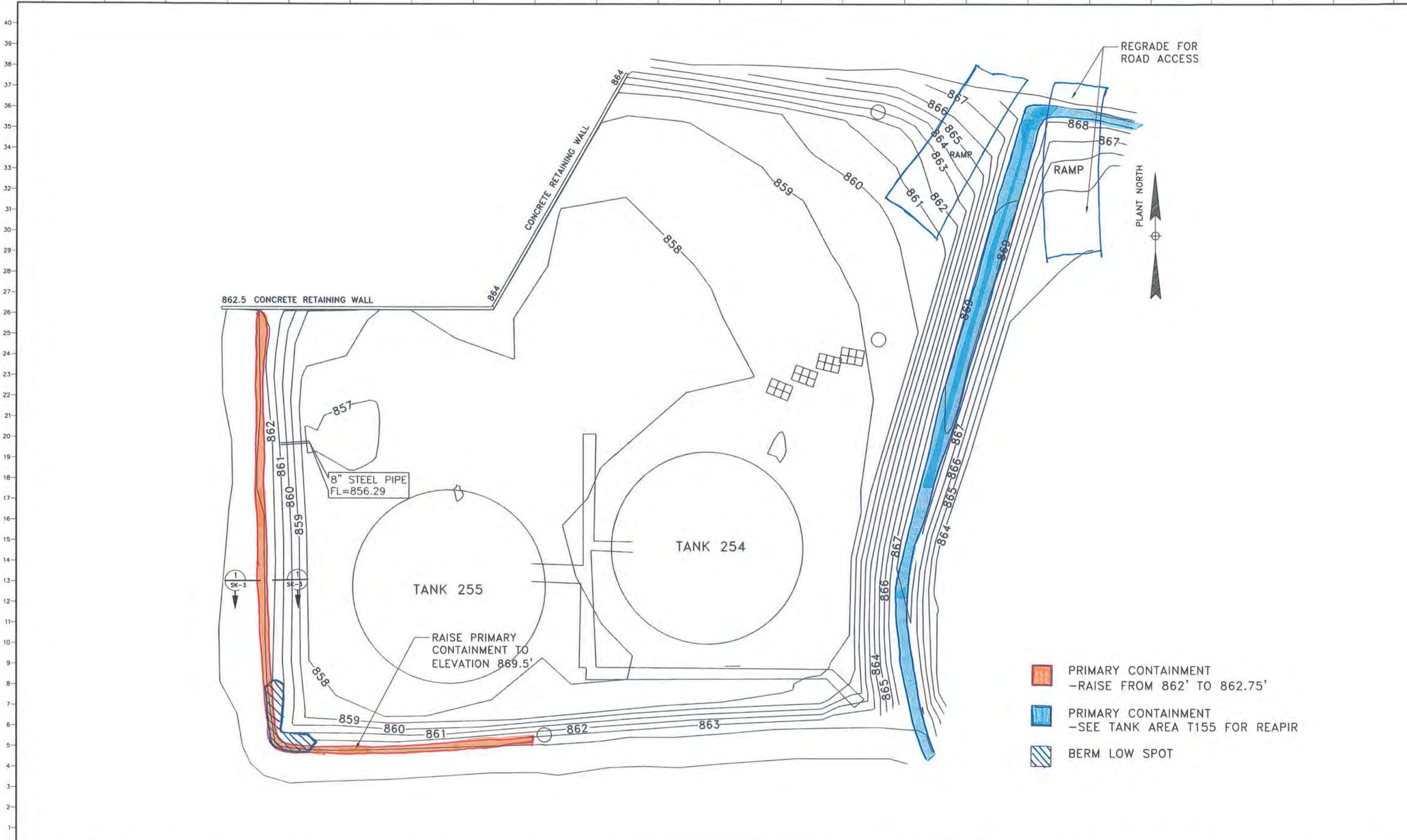
Tank Areas - T254, T255

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
255	24,838	139,455	163,948	862.00	141,898	862.75	170,301	**0.75**

Recommendations:

1. Raise primary berm (shown in orange) to required elev. = 862.75 feet



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

FOR:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	

TANKS T150, T152, T154, T155, T156

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/18/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

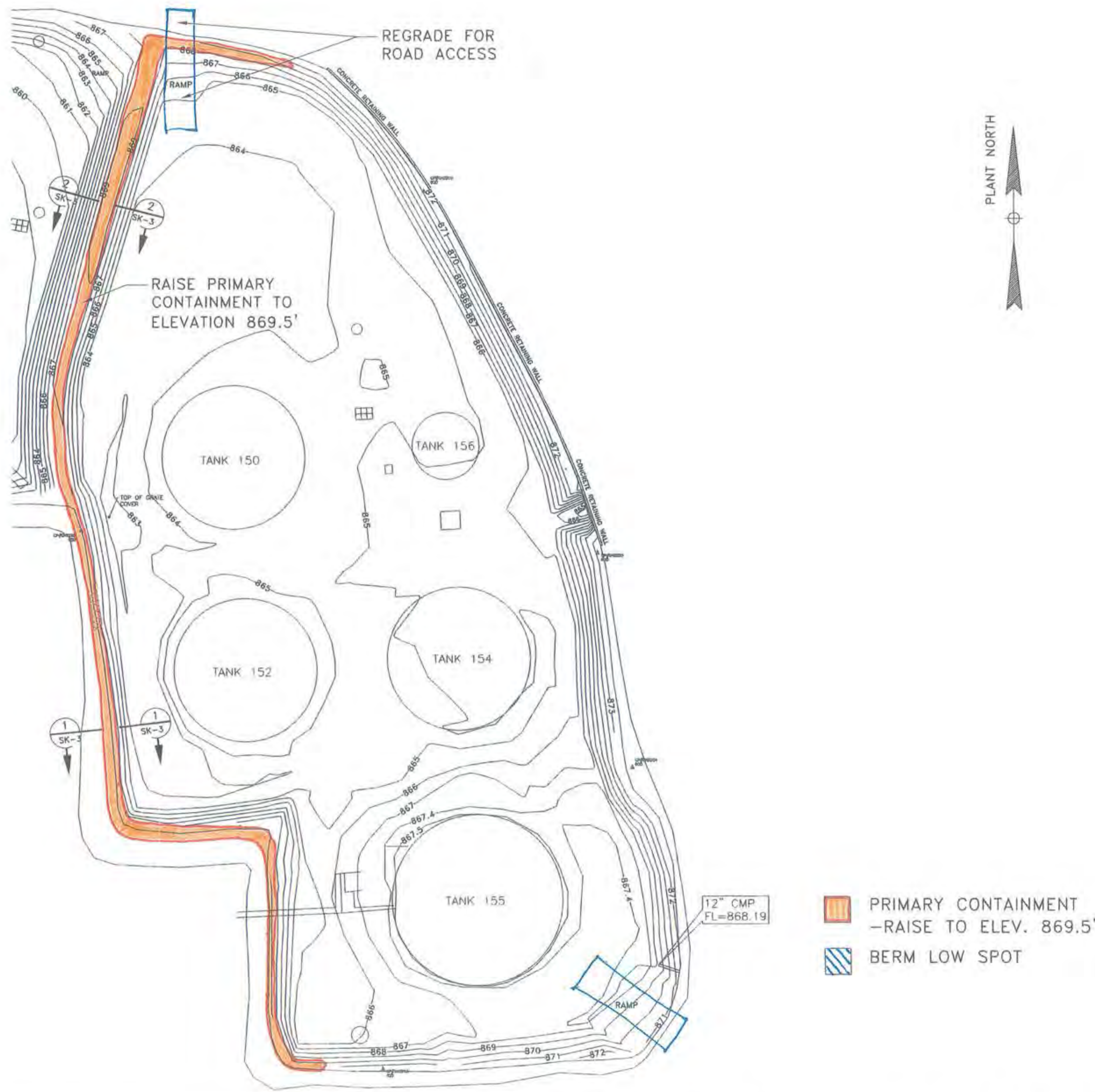
Tank Areas - T150 T152 T154 T155

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
155	44,444	249,535	290,035	867.00	158,673	869.50	303,356	**2.50**

Recommendations:

1. Raise primary berm (shown in orange) to required elev. = 869.50 feet
2. Re-grade road entrance areas to access final berm elevations.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

FOR:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	APPROVAL ENG.	APPROVAL PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO: 10-112390	DWG. NO: SK-2	

TANKS T111, T256, T257

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/18/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

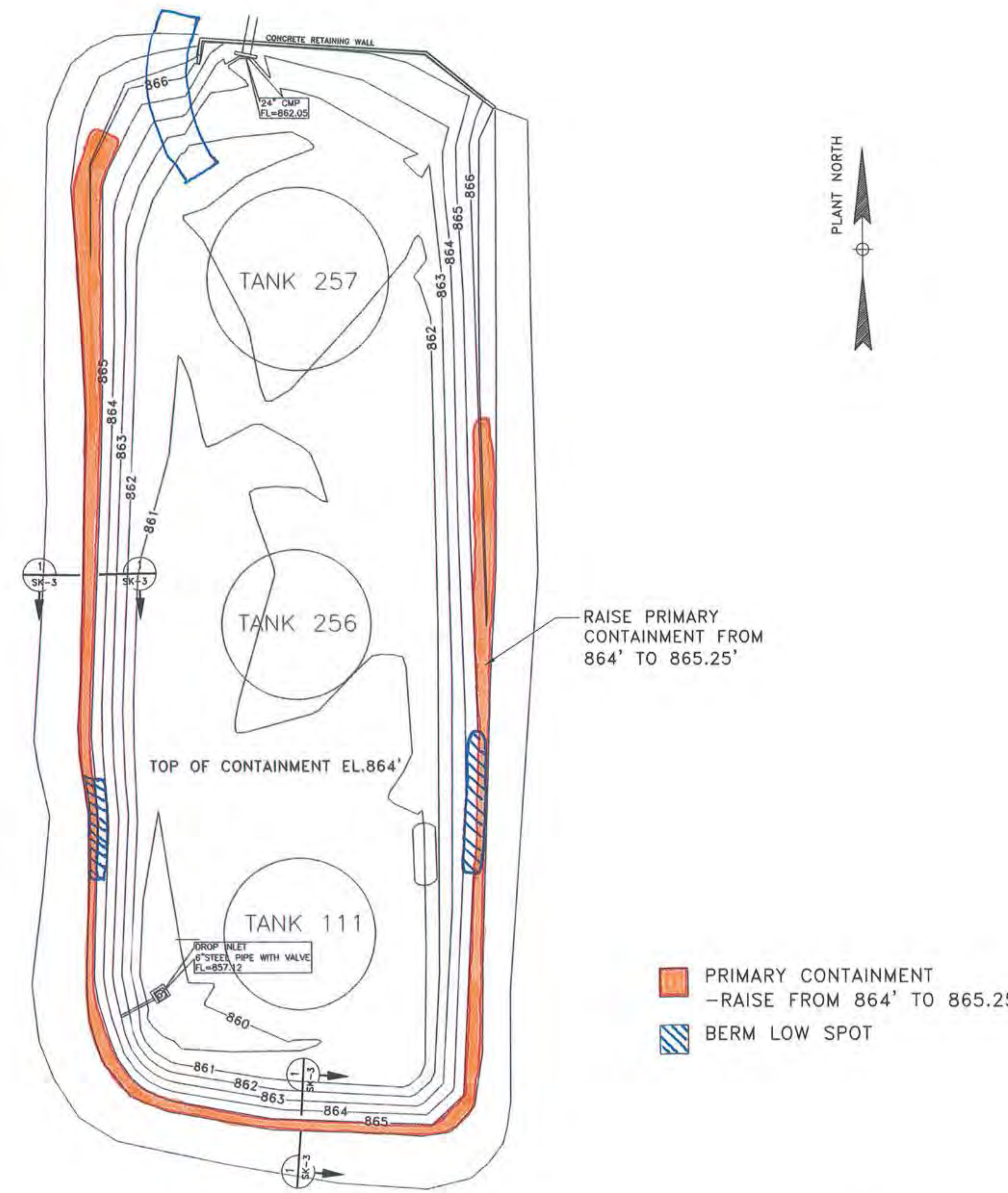
Tank Areas - T111, T256, T257

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
257	10,113	56,780	67,964	864.00	48,137	865.25	69,358	**1.25**

Recommendations:

1. Raise primary berm (shown in orange) to required elevation = 865.25'



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

FOR:

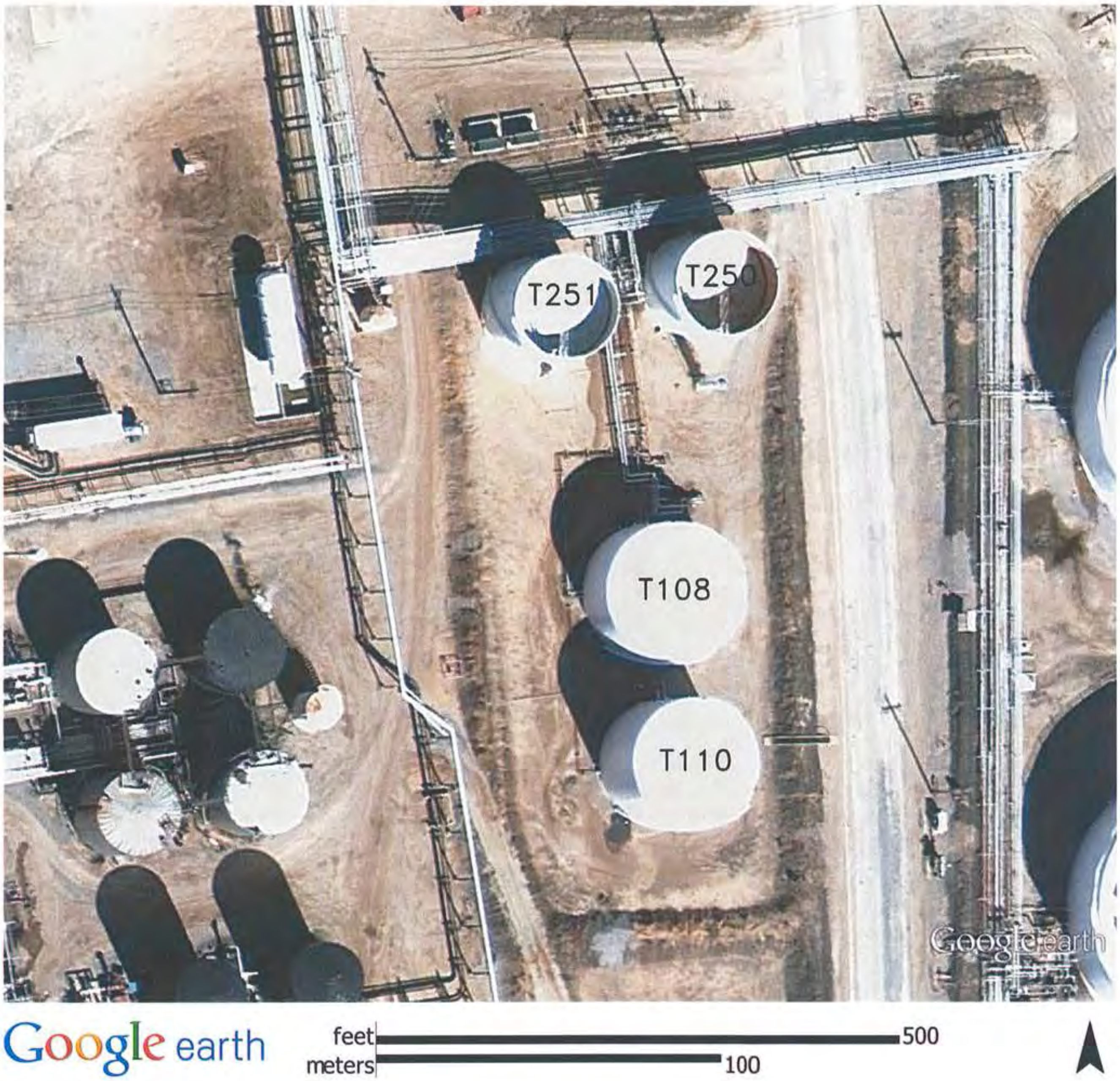
ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	



TANKS T108, T110, T250, T251

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR: WYNNEWOOD REFINERY	DWN. HJB	DATE: 1/15/14	PROJECT NO: 10-112390	DWG. NO. SK-1
WYNNEWOOD, OK	CHK. HJB	SCALE: NONE	CAD SAVE NAME: ----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/18/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

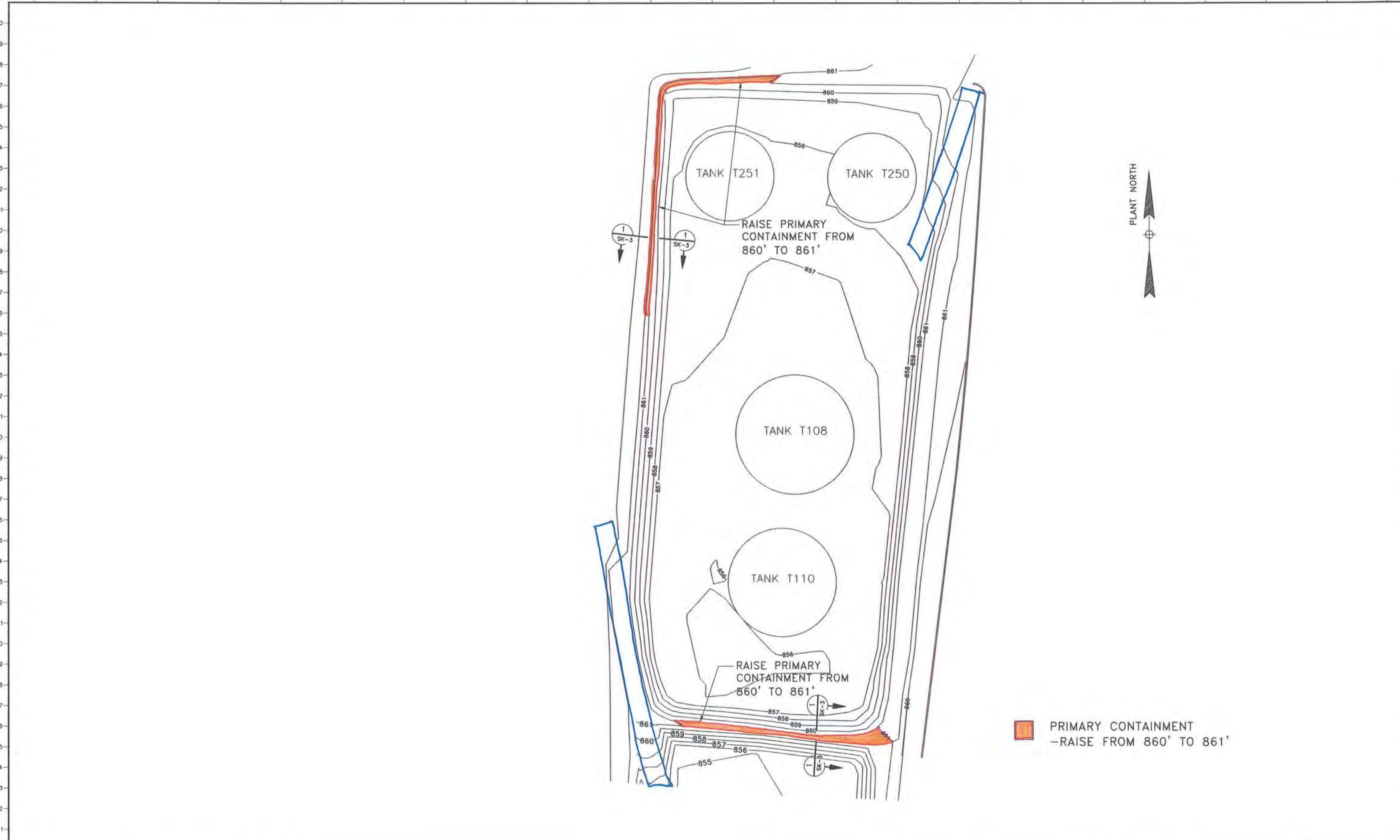
Tank Area - T108, T110, T250, T251

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
110	15,018	84,320	106,964	860.00	79,670	861.00	112575	**1.00**

Recommendations:

1. Raise primary berm (shown in orange) to required elevation = 856'
2. Re-grade road entrance areas to access final berm elevations.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL.

FOR:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	APPROVAL ENG.	APPROVAL PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	

Google earth feet 800 meters 200

TANKS T136, T138, T140

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	JOB NO.:	10-112390 (82)	SHEET:	1
LOCATION:	Wynnewood, Oklahoma	CALCS BY:	Zulfiquar Syed	DATE:	
SUBJECT:	Existing Tank Berm Capacities	CHECKED BY:	H.J. Brownson, P.E.	DATE:	12/17/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Area - T136 T138 T140

Secondary Containment:

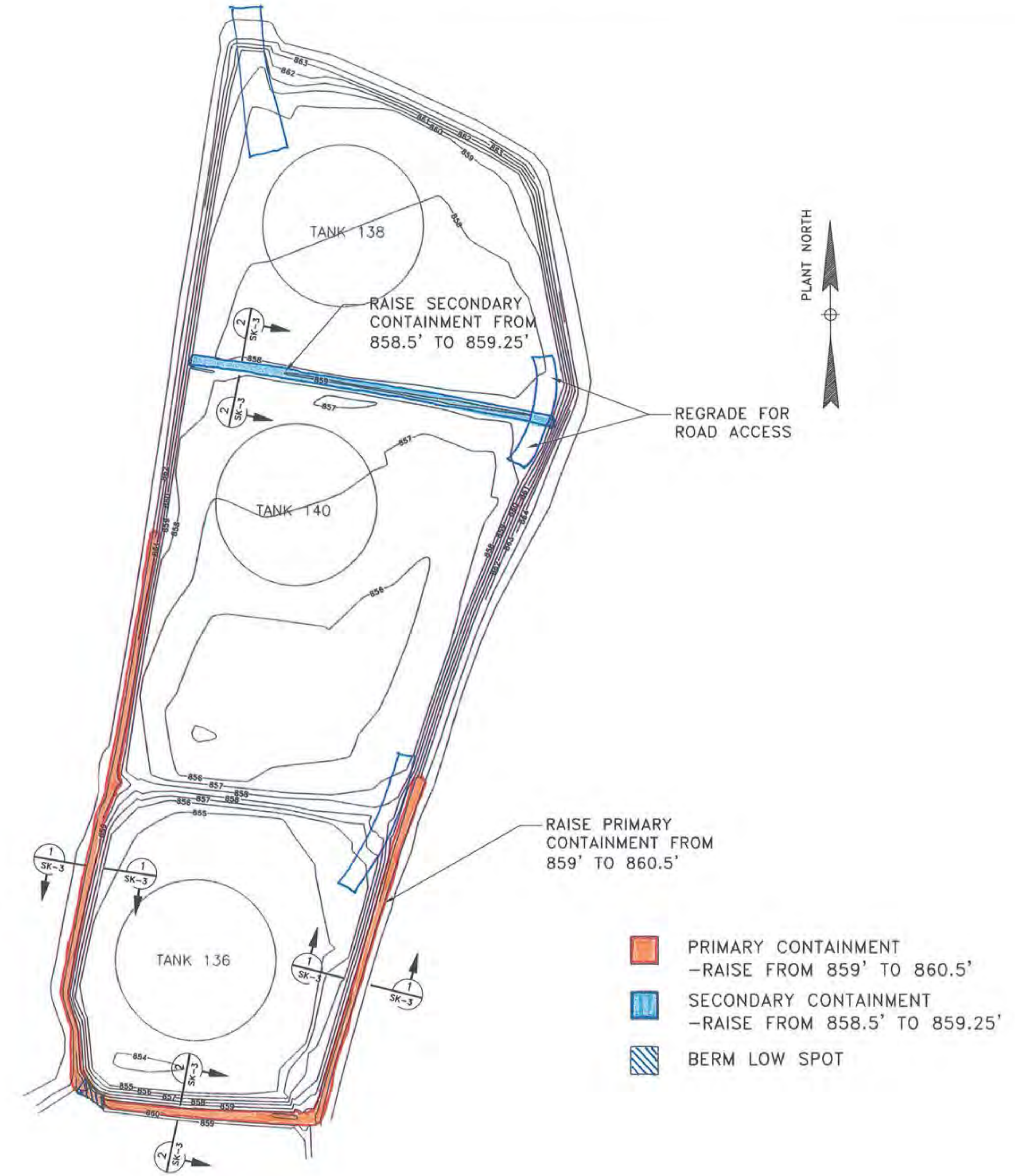
Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
136	80,458	451,739	45,174	858.50	116,615	N/A	N/A	**N/A**
138	80,456	451,728	45,173	858.50	12,301	859.25	46,422	**0.75**
140	80,422	451,537	45,154	858.50	104,658	N/A	N/A	**N/A**

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
136	80,458	451,739	550,774	859.00	298,501	860.50	898,444	**1.50**

Recommendations:

1. Raise primary berm (shown in orange) to required elevation = 860.5'.
2. Raise secondary berm (shown in blue) to required elevation = 859.25'.
3. Re-grade road entrance areas to access final berm elevations.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL.

FOR:

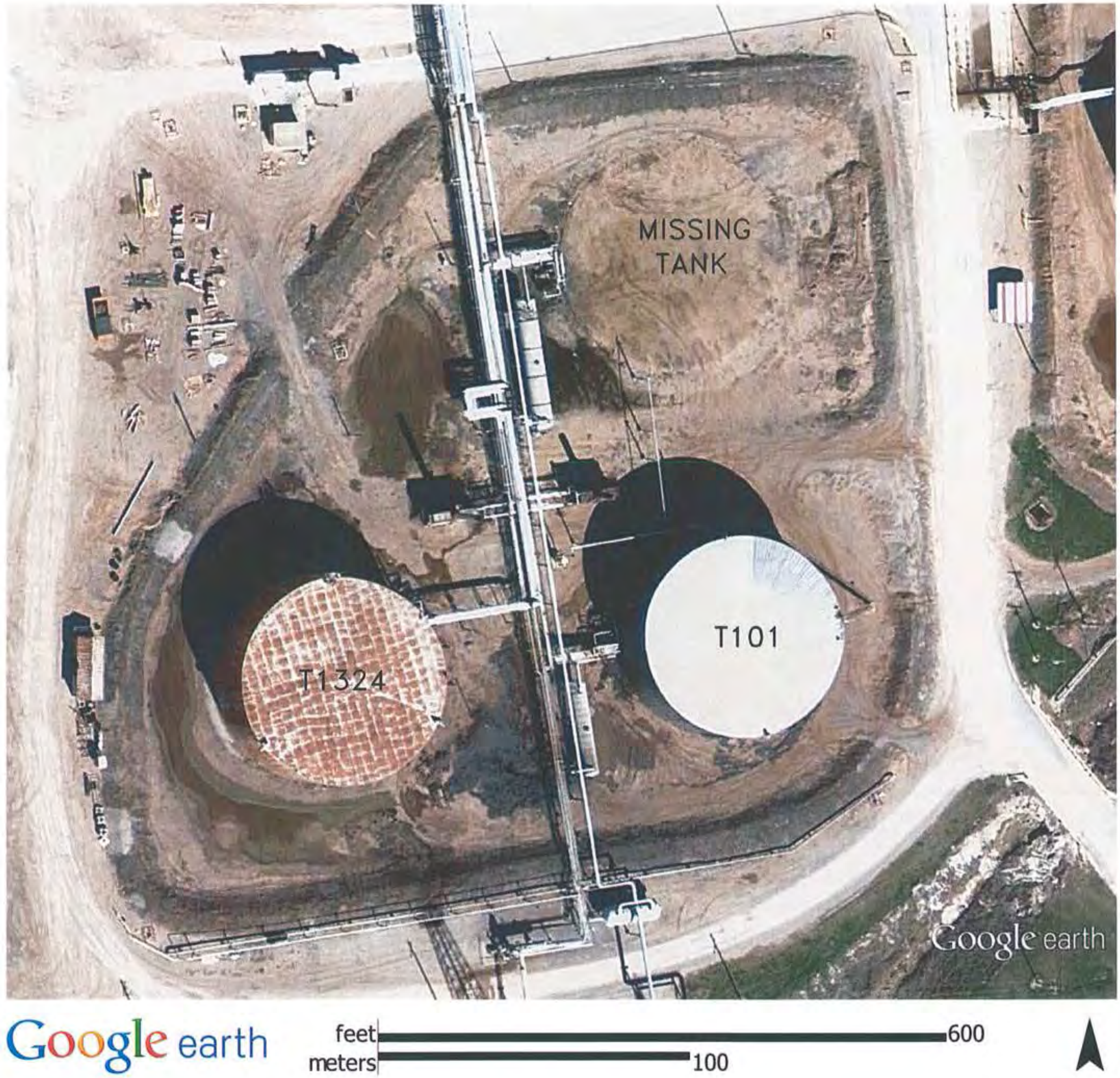
NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	



TANKS T101, T1324

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/15/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

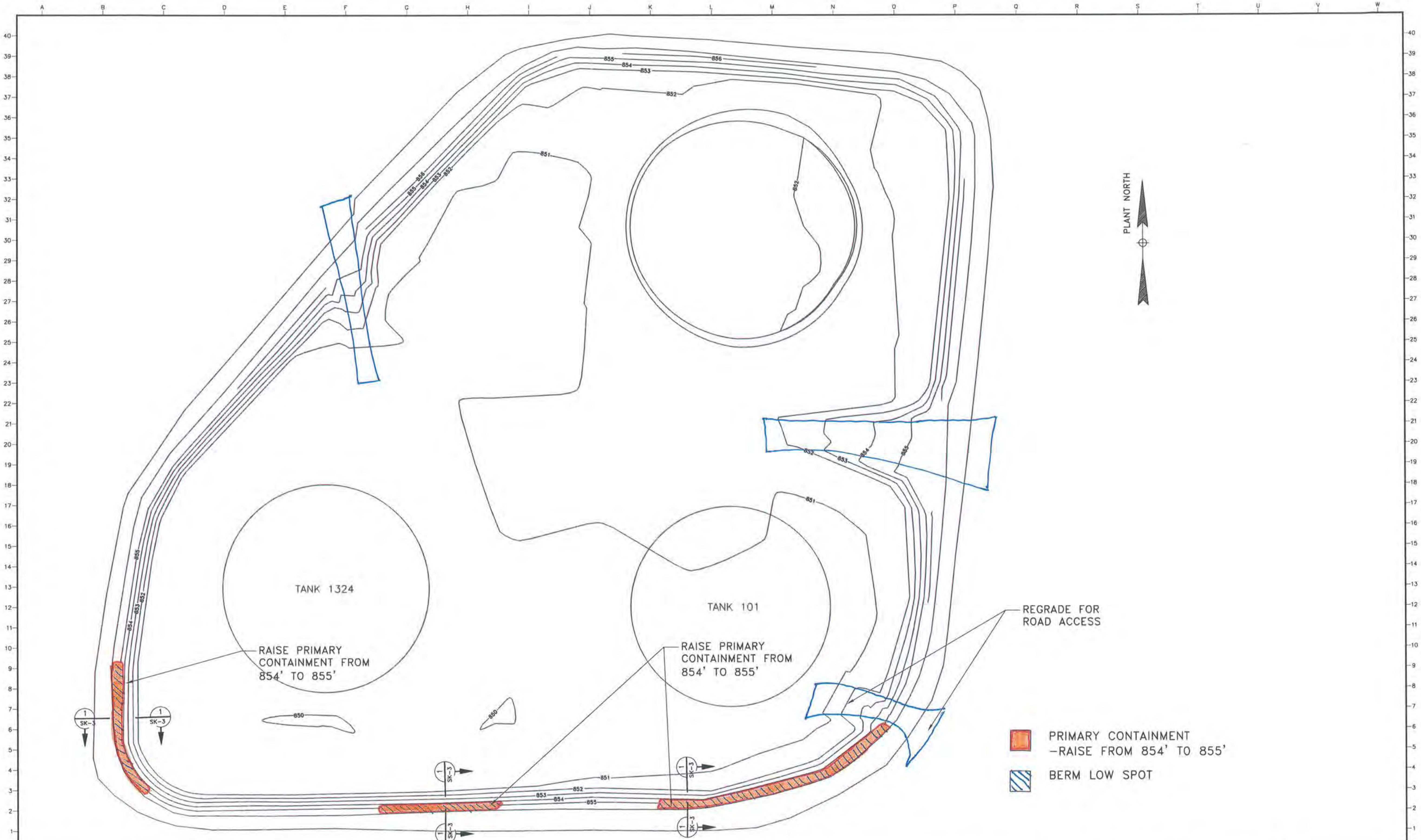
Tank Area - T101, T1324

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
1324	66,590	373,876	536,955	854.00	380,677	855.00	647,478	**1.00**

Recommendations:

1. Raise primary berm (shown in orange) to required elevation = 855'.
2. Re-grade road entrance areas to access final berm elevations.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL.

FOR:

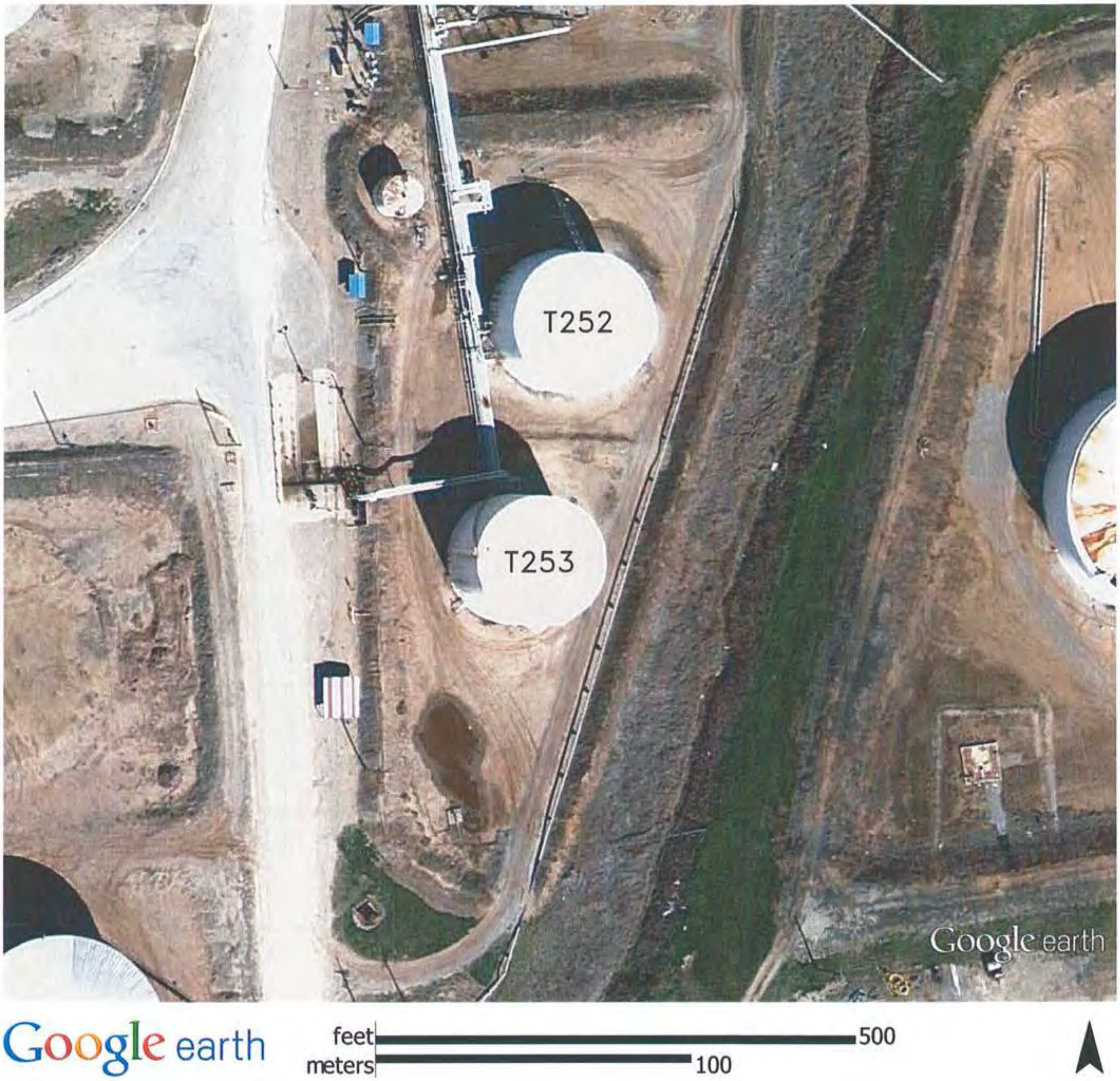
NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	APPROVAL ENG.	APPROVAL PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	



TANKS T252, T253

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/16/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Area - T252, T253

Secondary Containment:

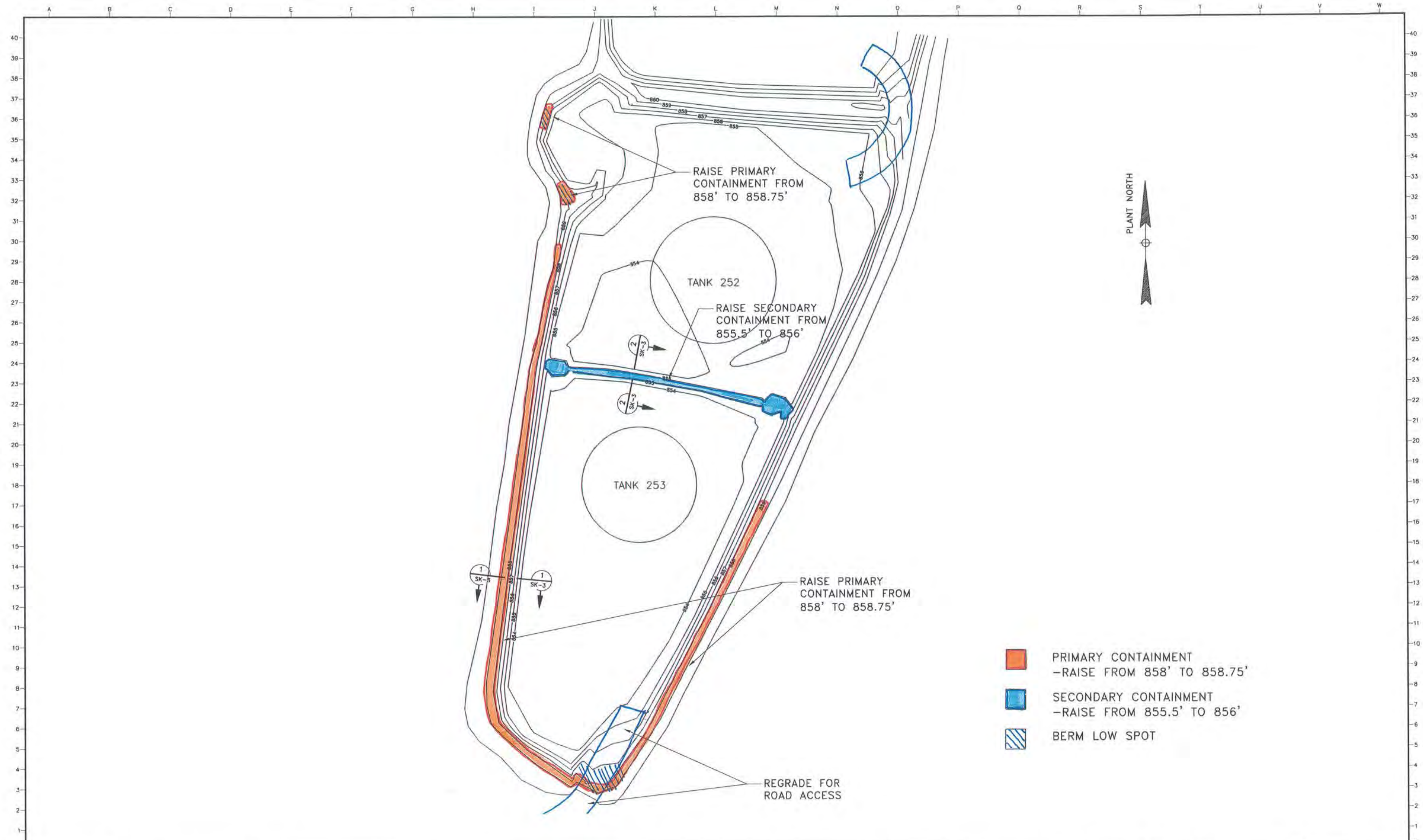
Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (10%) (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
252	26,828	150,628	15,063	855.50	11,006	856.00	20,933	**0.50**
253	25,130	141,095	14,109	855.50	26,566	856.00	38,464	**0.50**

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
252	26,828	150,628	181,277	858.00	152,566	858.75	194666	**0.75**

Recommendations:

1. Raise primary berm (shown in orange) to required elevation = 856'
2. Raise secondary berm (shown in blue) to required elevation = 858.75'
3. Re-grade road entrance areas to access final berm elevations.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

FOR:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	APPROVAL ENG.	APPROVAL PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	

TANK T1449

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/11/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

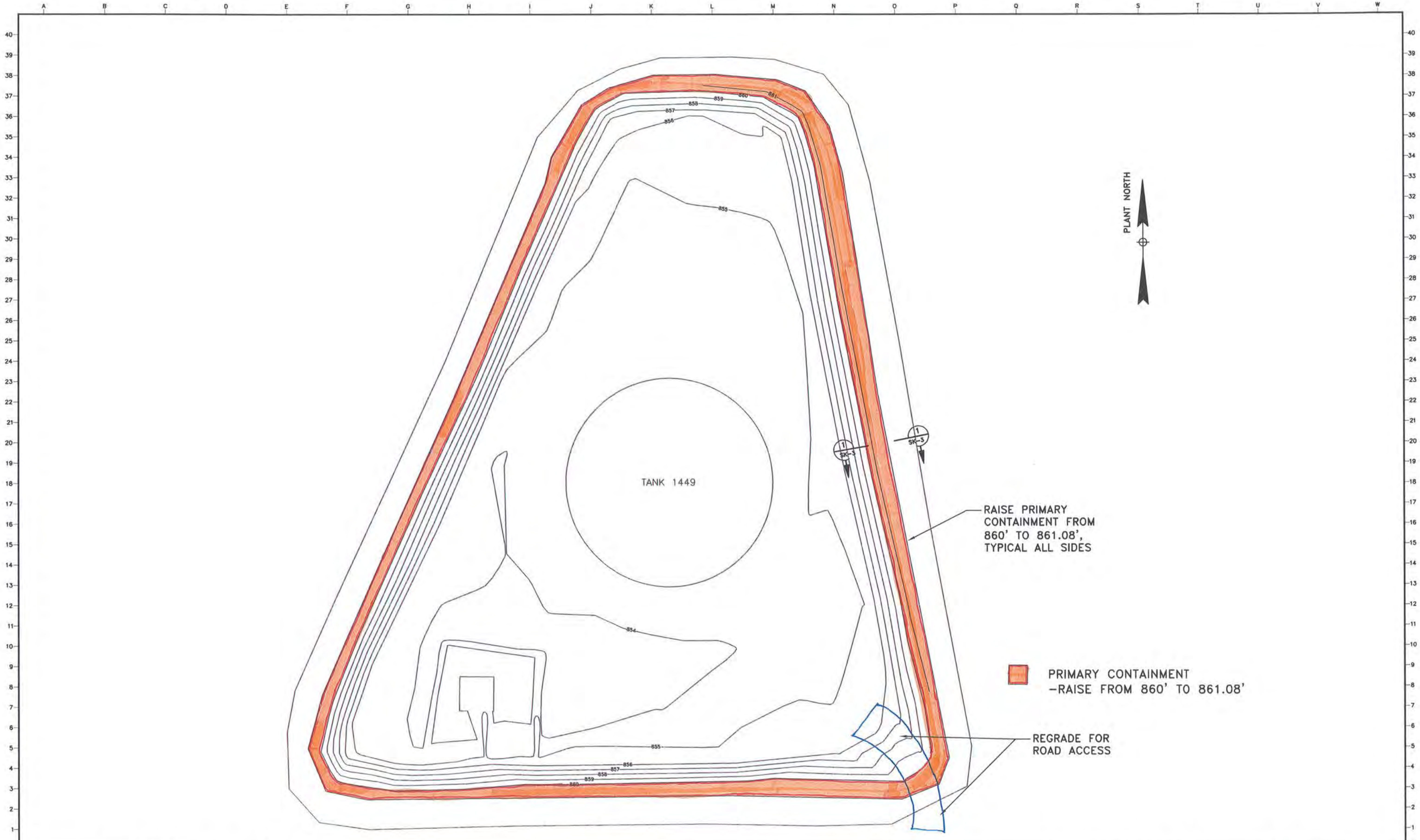
Tank Area - T1449

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
1449	76,425	429,096	484,781	860.00	387,713	861.08	489,357	**1.08**

Recommendations:

1. Raise primary berm (shown in orange) to required elevation = 861.08'.
2. Re-grade road entrance areas to access final berm elevations.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

FOR:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO.	SK-2

TANK T2003

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/16/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

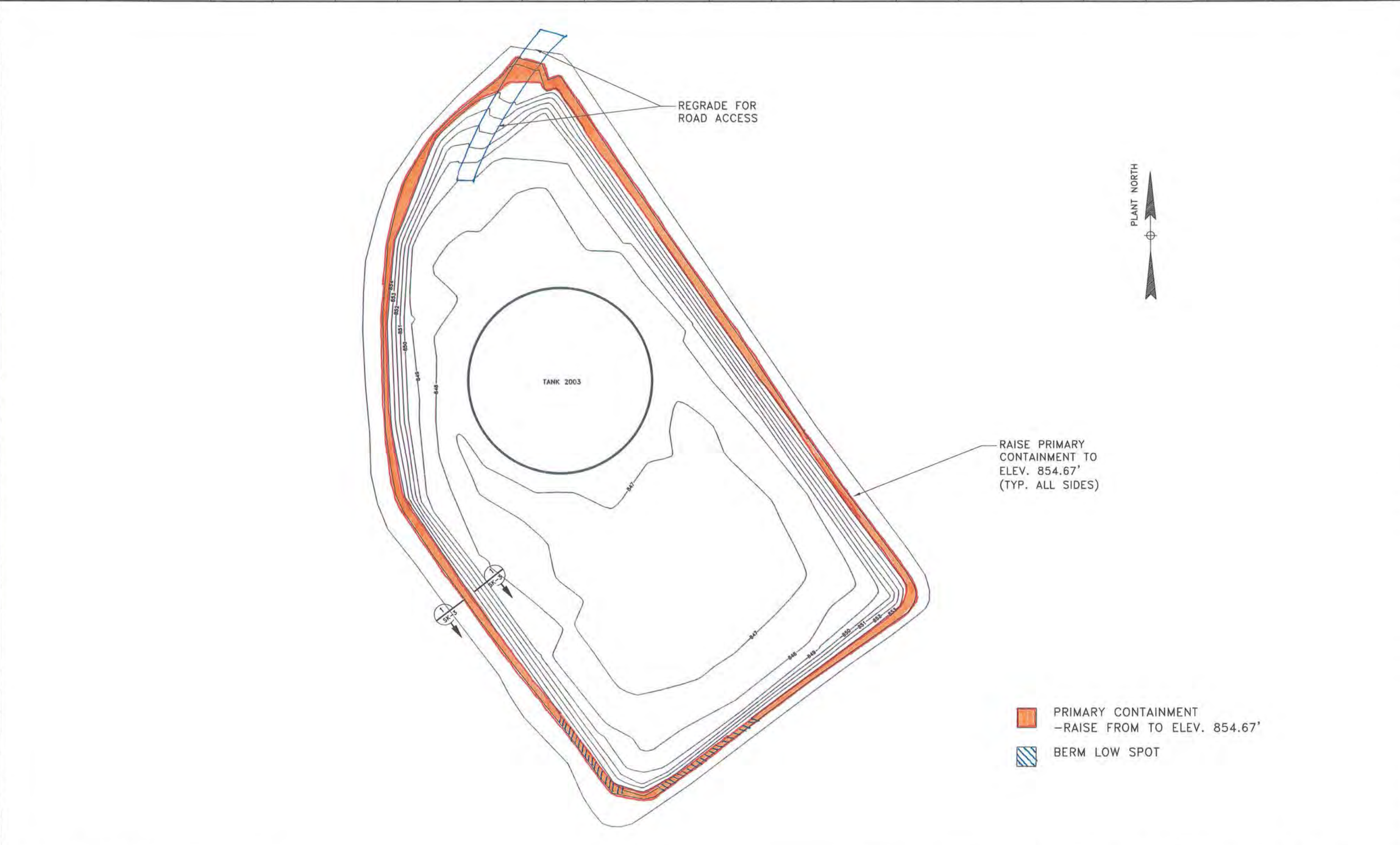
Tank Area - T2003

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
2003	94,500	530,580	584,592	852.00	339,073	854.67	596,135	**2.67**

Recommendations:

1. Raise primary berm (shown in orange) to elevation = 854.67'.
2. Re-grade road entrance areas to access final berm elevations.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

FOR:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	APPROVAL ENG.	APPROVAL PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	

Google earth

feet 700

meters 200

TANKS T142, T143, T144, T146, T164

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	1/8/2014

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Areas - T146

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
146	80,662	452,885	500,009	879.00	343,753	881.00	500,276	**2.00**

Recommendations:

1. Raise primary berm (shown in green) to required elev. = 881.00 feet
2. Regrade for road access.

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	1/8/2014

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Areas - T142

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
142	55,904	313,879	350,391	879.00	307,249	880.00	368,960	**1.00**

Recommendations:

1. Raise primary berm (shown in orange) to required elev. = 880.00 feet
2. Regrade for road access.

ENGlobal®

CLIENT:	Wynnewood Refinery	JOB NO.:	10-112390 (82)	SHEET:	1
LOCATION:	Wynnewood, Oklahoma	CALCS BY:	Zulfiquar Syed	DATE:	
SUBJECT:	Existing Tank Berm Capacities	CHECKED BY:	H.J. Brownson, P.E.	DATE:	1/8/2014

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Areas - T143

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
143	55,990	314,361	350,649	881.00	239,117	883.00	361,779	**2.00**

Recommendations:

1. Raise primary berm (shown in pink) to required elev. = 883.00 feet
2. Regrade for road access

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	1/8/2014

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

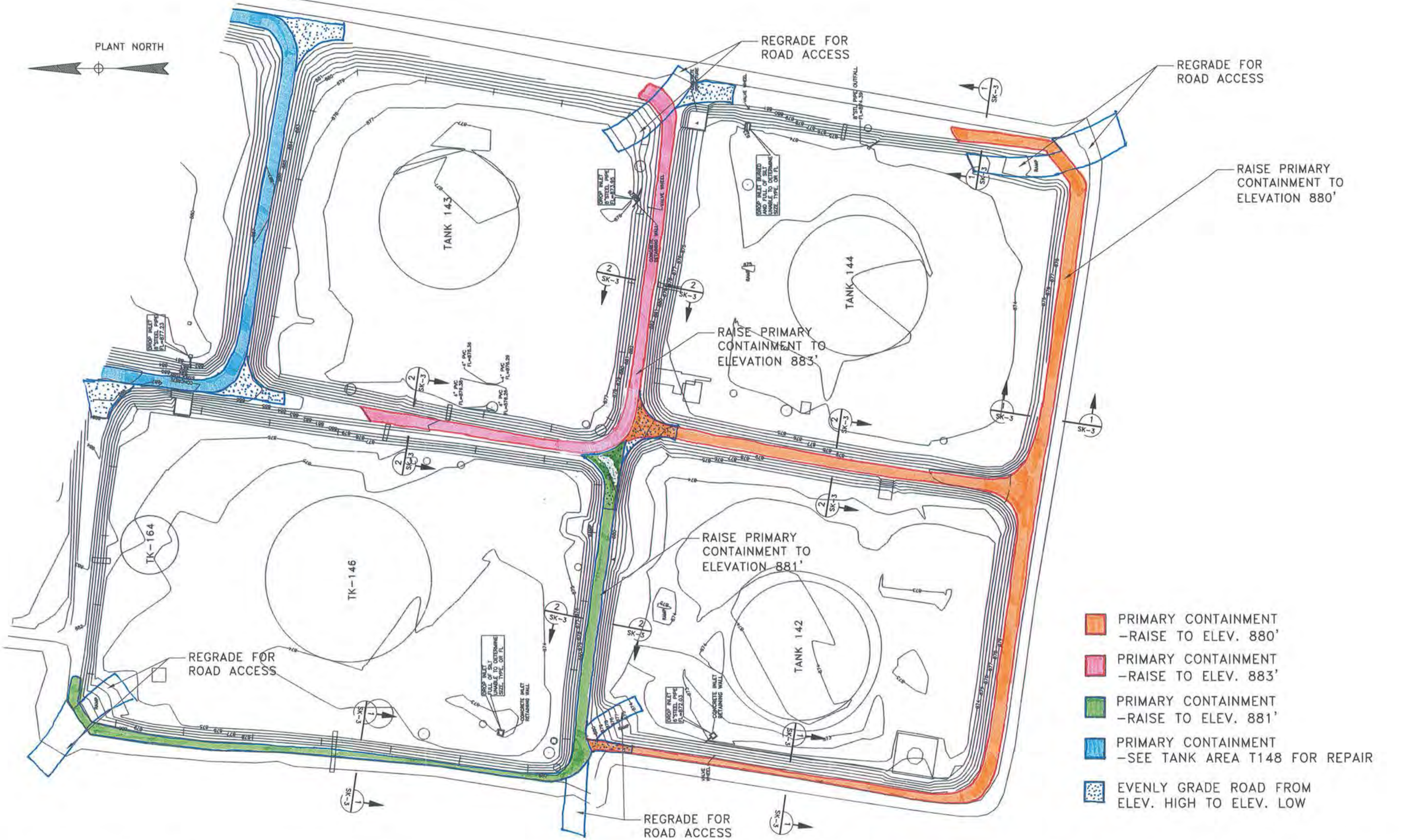
Tank Areas - T144

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
144	55,899	313,851	350,745	878.00	236,233	880.00	360,947	**2.00**

Recommendations:

1. Raise primary berm (shown in orange) to required elev. = 880.00 feet
2. Regrade for road access



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL.

FOR:

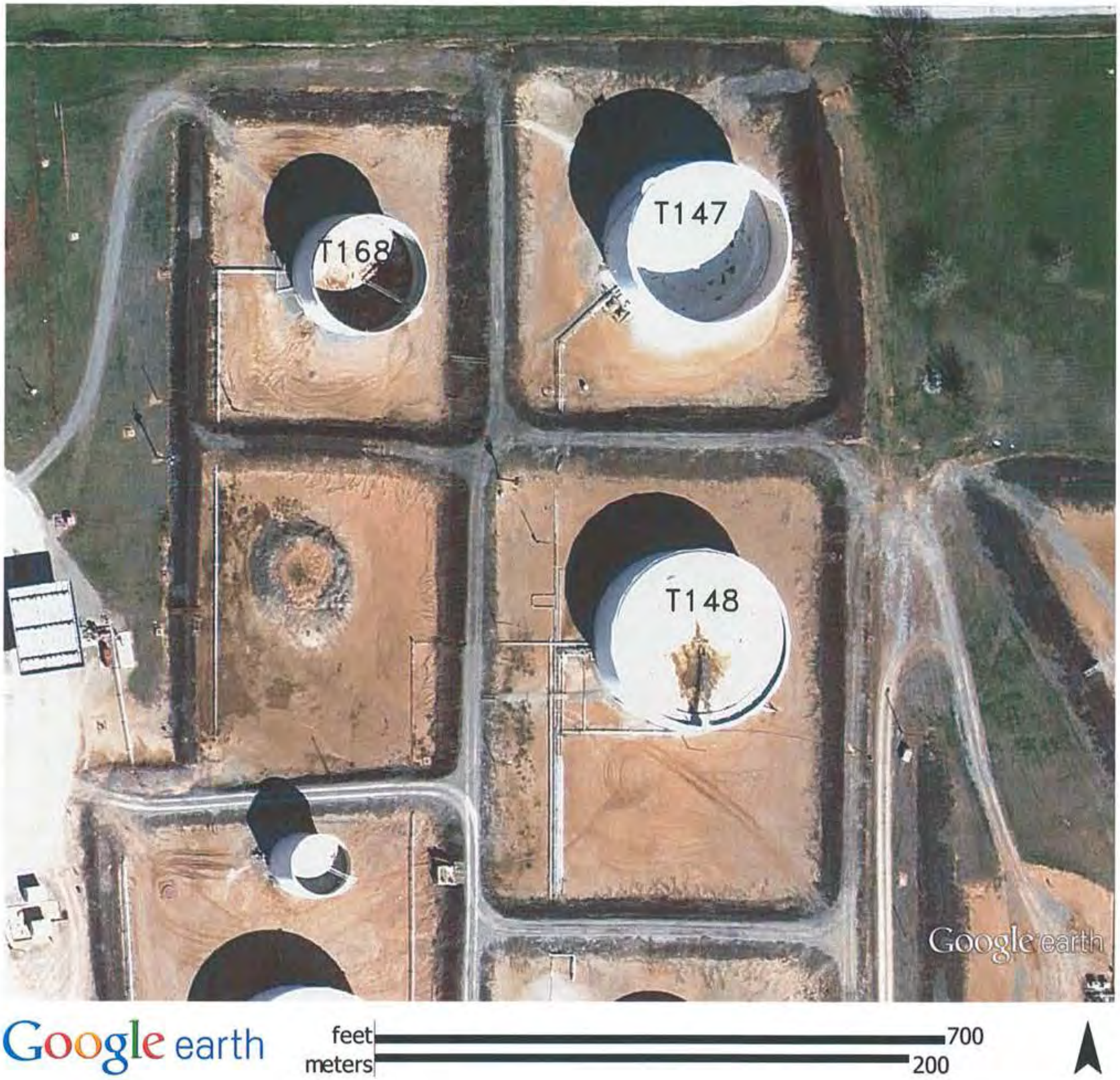
NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	



TANK T147, T148, T168

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	1/8/2014

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Areas - T147

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
147	81,024	454,917	487,306	895.00	374,665	897.33	502,212	**2.33**

Recommendations:

1. Raise primary berm (shown in orange) to required elev. = 897.33 feet

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	1/8/2014

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Areas - T148

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
148	80,016	449,258	494,160	886.00	388,989	887.50	502,825	**1.50**

Recommendations:

1. Raise primary berm (shown in orange) to required elev. = 887.50 feet

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	1/8/2014

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Areas - T168

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
168	35,801	201,008	224,387	886.00	175,279	887.50	234,548	**1.50**

Recommendations:

1. Raise primary berm (shown in orange) to required elev. = 887.50 feet
2. Regrade for road access

REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL.

FOR:

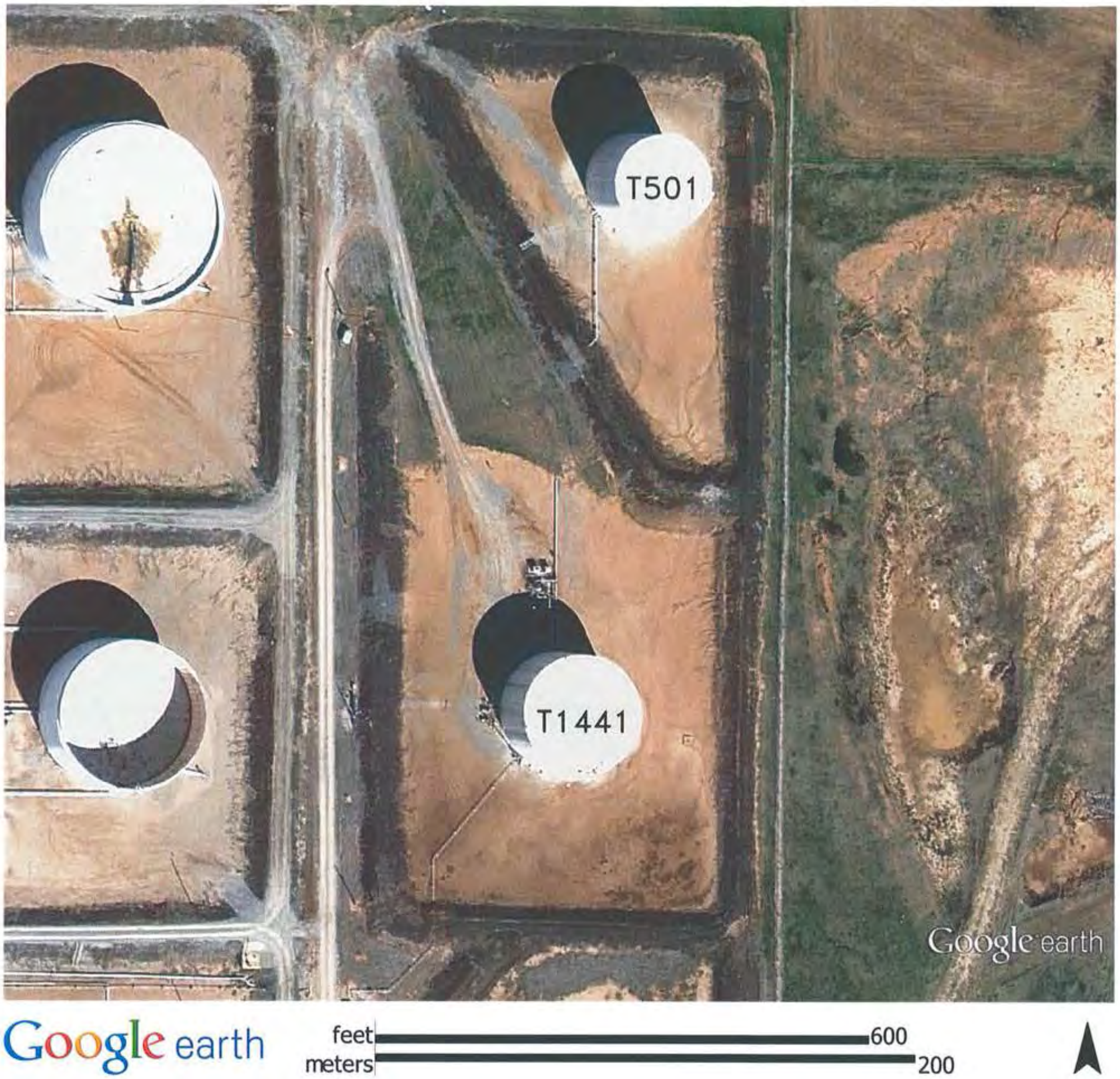
NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO.	SK-2



TANK T501, T1441

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR: WYNNEWOOD REFINERY	DWN. HJB	DATE: 1/15/14	PROJECT NO: 10-112390	DWG. NO. SK-1
WYNNEWOOD, OK	CHK. HJB	SCALE: NONE	CAD SAVE NAME: ----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	1/4/2014

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Areas - T501

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
501	25,750	144,576	165,723	890.00	116,997	892.00	170,610	**2.00**

Recommendations:

1. Raise primary berm (shown in orange) to required elev. = 892.00 feet

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	1/4/2014

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

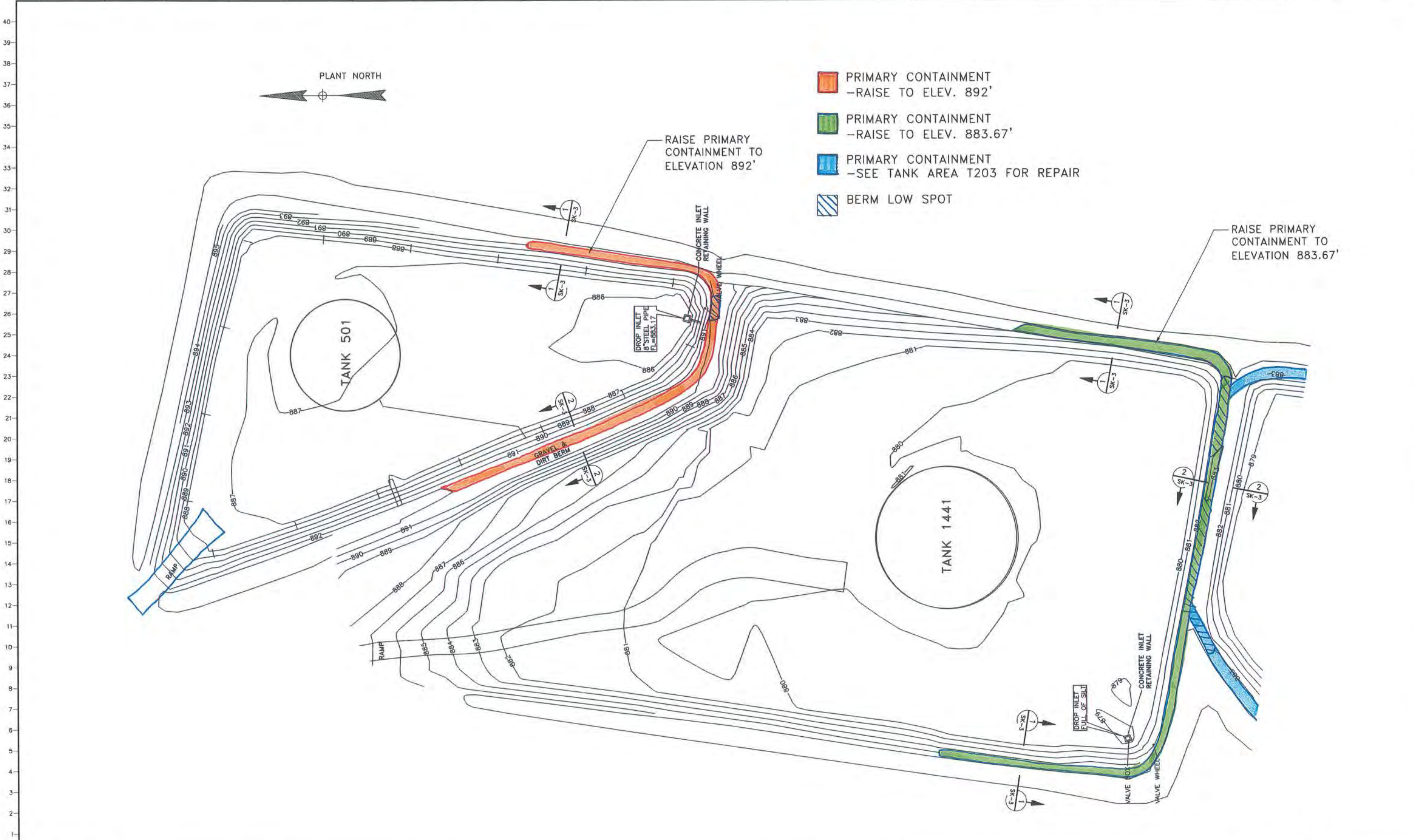
Tank Areas - T1441

Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
1441	35,716	200,531	240,891	882.00	135,219	883.67	249,136	**1.67**

Recommendations:

1. Raise primary berm (shown in green) to required elev. = 883.67 feet



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

FOR:

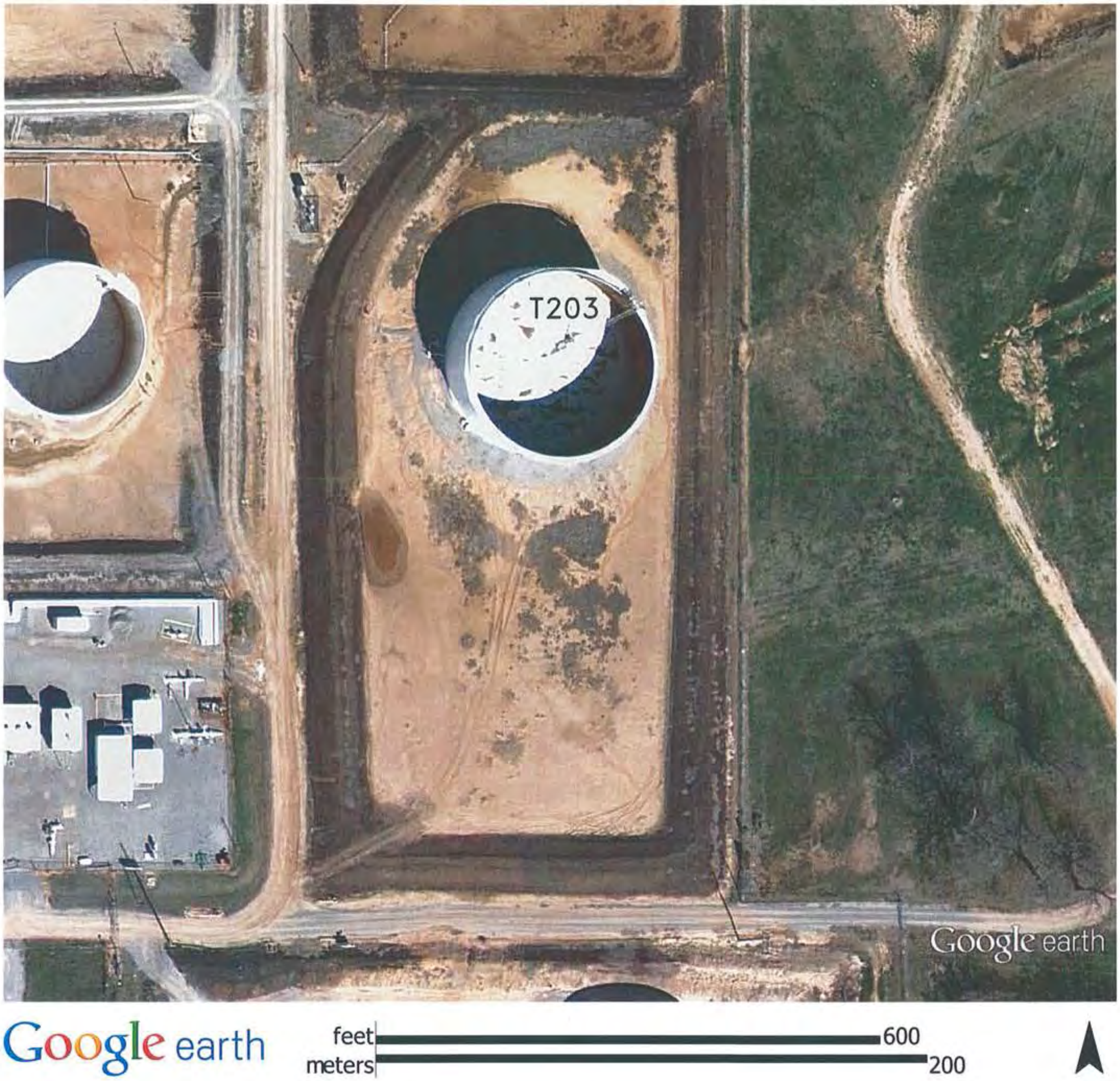
NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	ENG.	PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	



TANK T203

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®

TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood, Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/28/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

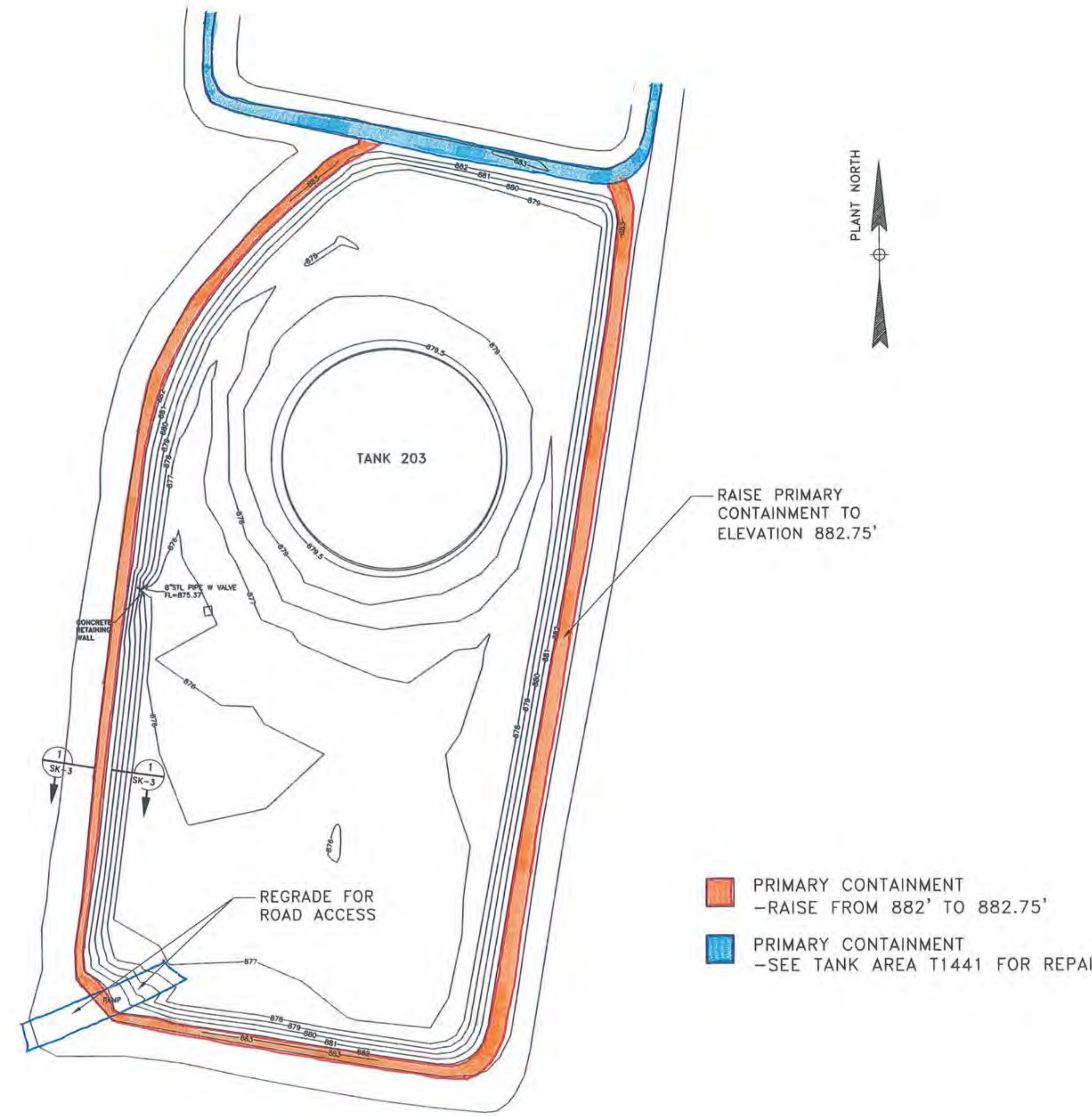
Tank Areas - T203

Primary Containment:

Tank	Tank Capacity		Volume of Liquid	Existing Berm Capacity Low Point	Existing Berm Capacity	Repaired Berm Elevation	Repaired Berm Volume	Berm Increase
	(bbl.)	(cu. ft.)	(cu. ft.)	(ft.)	(cu. ft.)	(ft.)	(cu. ft.)	(ft.)
203	80,233	450,476	513,843	882.00	451,740	882.75	532,064	**0.75**

Recommendations:

1. Raise primary berm (shown in orange) to required elev. = 882.75 feet
2. Re-grade road entrance areas to access final berm elevations.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

FOR:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	APPROVAL ENG.	APPROVAL PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN
WYNNEWOOD REFINERY WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/15/14
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	

TANKS T303, T306

ENGlobal Engineering, Inc.
Oklahoma CA #3337 PE/LS
Renewal Date: 6/30/14

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS

FOR:	DWN.	DATE:	PROJECT NO:	DWG. NO.
WYNNEWOOD REFINERY	HJB	1/15/14	10-112390	SK-1
	CHK.	SCALE:	CAD SAVE NAME:	
WYNNEWOOD, OK	HJB	NONE	----	

ENGlobal®

CLIENT:	Wynnewood Refinery	**JOB NO.:**	10-112390 (82)	**SHEET:**	1
LOCATION:	Wynnewood Oklahoma	**CALCS BY:**	Zulfiquar Syed	**DATE:**	
SUBJECT:	Existing Tank Berm Capacities	**CHECKED BY:**	H.J. Brownson, P.E.	**DATE:**	12/9/2013

Tank Berm Capacity Calculations and Recommendations

Design Criteria:

1. Check primary containment of a single tank volume or the the tank with the largest volume when in a group. The primary containment volume consists of the maximum capacity of the tank (supplied by WRC) plus the amount of precipitation that occurs during a 25 year/24 hour rainfall event (7.1 inches).
2. Check secondary containment for each tank within a group of tanks that has lower dikes that subdivide the primary containment area. The secondary containment volume is equal to 10% of the tank maximum capacity to represent a minor spill.
3. The containment volume (both primary and secondary) is calculated using the volumes taken from the topographic surveys provided by Gorrondona and Associates, Inc.

Tank Area - T303, T306

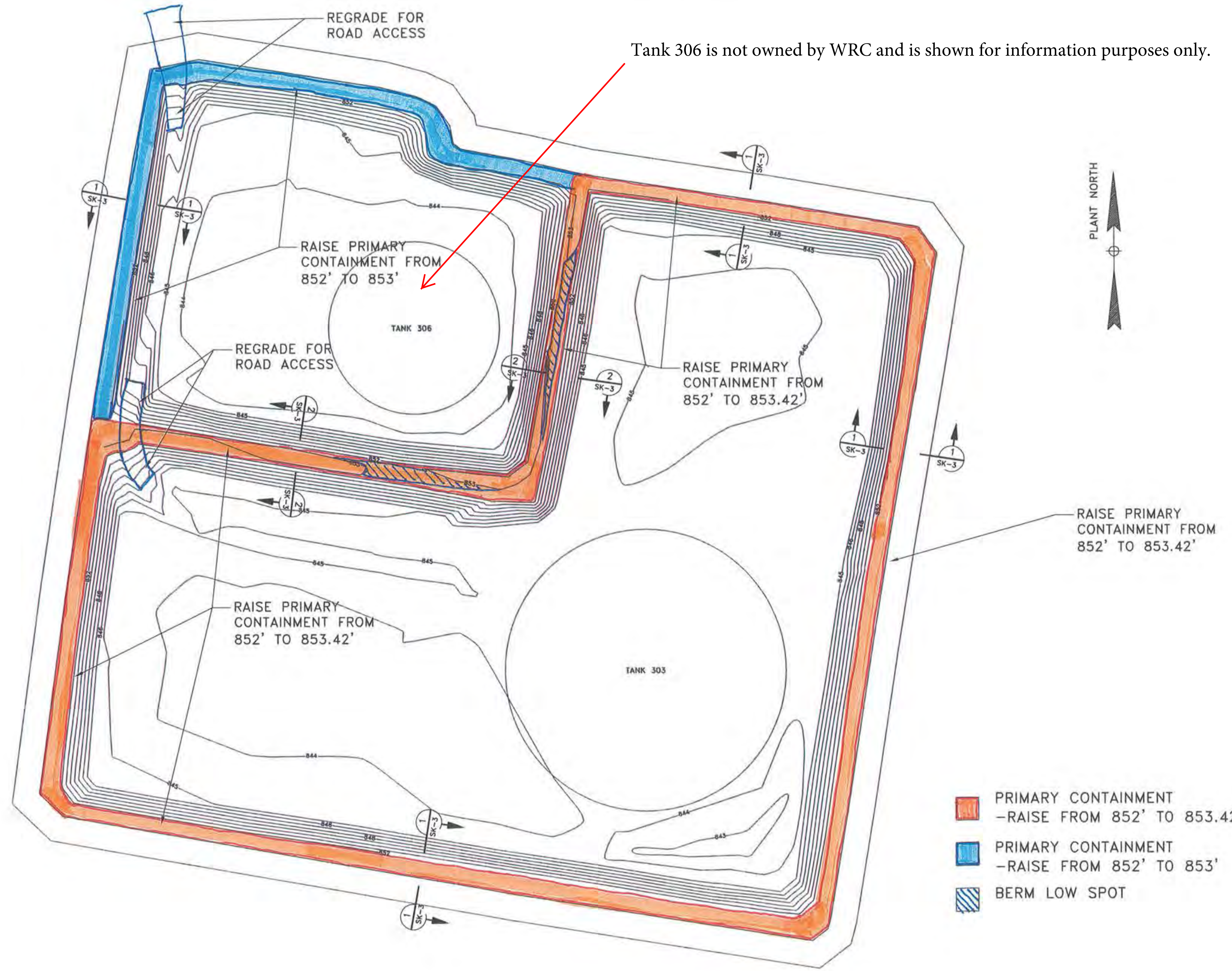
Primary Containment:

Tank	Tank Capacity (bbl.)	Tank Capacity (cu. ft.)	Volume of Liquid (cu. ft.)	Existing Berm Capacity Low Point (ft.)	Existing Berm Capacity (cu. ft.)	Repaired Berm Elevation (ft.)	Repaired Berm Volume (cu. ft.)	Berm Increase (ft.)
303	255,053	1,432,021	1,548,297	852.00	1,274,103	853.42	1,553,167	**1.42**

Recommendations:

1. Raise primary berm (shown in orange) to required elevation = 853.42'.
2. Raise primary berm (shown in blue) to required elevation = 853.00'.
3. Re-grade road entrance areas to access final berm elevations.

Tank 306 is not owned by WRC and is shown for information purposes only.



REFERENCE DRAWINGS	
G-SK-1	PLOT PLAN
G-SK-2	CONSTRUCTION NOTES
SK-3	TANK BERM REPAIR DETAILS

GENERAL NOTES:

CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE DISCLOSED USED, DUPLICATED OR RETAINED EXCEPT AS IN WRITING BY ENGLOBAL.

FOR:

NO.	REVISION	PROJECT NO.	BY	DATE	APPROVAL CHK.	APPROVAL ENG.	APPROVAL PROJ.
0	ISSUE FOR CONSTRUCTION	10-112390	HJB	1/15/14	HJB	HJB	MAR

ENGlobal®
TULSA, OKLAHOMA

TANK CONTAINMENT
CALCULATIONS AND RECOMMENDATIONS
TANK CONTAINMENT REPAIR PLAN

WYNNEWOOD REFINERY — WYNNEWOOD, OK

DESIGNED BY: HJB	CHECKED BY: HJB	DATE: 1/14/15
DRAWN BY: HJB	APPROVED BY: MAR	SCALE: NONE
PROJECT NO.: 10-112390	DWG. NO. SK-2	

Table 22

Sufficient Freeboard Determination

Tank Number	Contents	Tank Maximum Capacity (Bbls)	Tanks Within The Same Secondary Containment Area	Berm Capacity, ft³		Berm Increase, ft
				Actual[1]	Required	
MSA-1						
6D-1	Alky Treat Charge	564	(4)	--	--	--
6D-4	Alky Treat Charge	564	(4)	--	--	--
D-170	Normal Butane	712	(4)	--	--	--
D-172	Normal Butane	712	(4)	--	--	--
D-174	Propane	712	(4)	--	--	--
D-176	Propane	712	(4)	--	--	--
D-178	Normal Butane	712	(4)	--	--	--
D-180	Iso-Butane	712	(4)	--	--	--
D-190	Alky Treat Charge	565	(4)	--	--	--
D-191	Alky Treat Charge	1,164	(4)	--	--	--
D-1401	Normal Butane	1,581	(4)	--	--	--
D-1402	Normal Butane	1,581	(4)	--	--	--
D-1403	Normal Butane	1,581	(4)	--	--	--
D-1404	Normal Butane	1,581	(4)	--	--	--
D-1405	Normal Butane	1,581	(4)	--	--	--
D-1406	Propylene	2,143	(4)	--	--	--
D-1407	Propylene	2,143	(4)	--	--	--
D-1408	Propylene	2,143	(4)	--	--	--
MSA-2						
126	Gas Oil/LCO	79,500	126	307,502	510,858	2.33
202	Gas Oil	80,000	202	315,218	500,798	2.33
MSA-3						
1181	Arbuckle Water	100,000	(2)	--	--	--
MSA-4						
951	**Out-of-Service**	10,000	951, 953, 2051	161,579	139,400	0
953	**Out-of-Service**	10,000	951, 953, 2051	161,579	139,400	0
2051	Sour Water	20,000	951, 953, 2051	161,579	139,400	0
MSA-5						
2007	API Separator Sludge	5,100	2007	78,000	35,660	0

Table 22 (Cont'd)

Sufficient Freeboard Determination

Tank Number	Contents	Maximum Capacity (Bbls)	Tanks Within The Same Secondary Containment Area	Berm Capacity, ft^3		Berm Increase, ft
				Actual	Required	
MSA-6						
1470	Regular Unleaded	79,600	1470,1471, 1473, 1475	437,672	499,664	0-3
1471	Unleaded Premium	34,800	1471, 1473, 1475	147,998	239,539	0-3
1472	Ultra Low Sulfur Diesel	34,700	1472, 1471, 1473, 1475	110,005	239,539	0-3
1473	Unleaded Premium	9,600	1473, 1471, 1475	28,512	239,539	0-3
1475	Ultra Low Sulfur Diesel	34,700	1473, 1471, 1475	9,534	239,539	0-3
1476	**Out-of-Service**	170	--	--	--	--
MSA-7						
67	Crude Oil	68,884	67, 68, 69, 70	395,019	898,444	2.42
68	Crude Oil	68,884	67, 68, 69, 70	395,019	898,444	2.42
69	Crude Oil	68,884	67, 68, 69, 70	395,019	898,444	2.42
70	Crude Oil	150,000	67, 68, 69, 70	395,019	898,444	2.42
71	Crude Oil	250,000	71	built to new design 2014	N/A	0
MSA-8						
182	Mixed Butane	1,427	(4)	--	--	--
183	Mixed Butane	1,427	(4)	--	--	--
184	Mixed Butane	1,533	(4)	--	--	--
185	Iso-Butane	1,533	(4)	--	--	--
186	Iso-Butane	2,370	(4)	--	--	--
187	Iso-Butane	2,400	(4)	--	--	--
MSA-9						
254	Cat Gasoline	24,800	254, 255	141,898	163,948	0.75
255	Straight Run Gasoline	24,800	254, 255	141,898	163,948	0.75
MSA-10						
150	Platformate	24,800	150, 152, 154, 155	158,673	290,035	2.50
152	Platformate	24,800	150, 152, 154, 155	158,673	290,035	2.50
154	Gasoline	24,800	150, 152, 154, 155	158,673	290,035	2.50
155	Sour Naptha	40,000	150, 152, 154, 155	158,673	290,035	2.50
156	**Out-of-Service**	2,500	--	--	--	--

Table 22 (Cont'd)

Sufficient Freeboard Determination

Tank Number	Contents	Maximum Capacity (Bbls)	Tanks Within The Same Secondary Containment Area	Berm Capacity, ft^3		Berm Increase, ft
				Actual	Required	
MSA-11						
111	JP-8	5,000	111, 256, 257	48,137	67,964	1.25
256	JP-5	5,000	111, 256, 257	48,137	67,964	1.25
257	Unified Naphtha	10,000	111, 256, 257	48,137	67,964	1.25
MSA-12						
108	JP-8	13,800	108, 110, 250, 251	79,670	106,964	1.0
110	Light Cycle Oil/DSL	15,000	108, 110, 250, 251	79,670	106,964	1.0
250	KW1-1/100W	10,000	108, 110, 250, 251	79,670	106,964	1.0
251	100W	10,000	108, 110, 250, 251	79,670	106,964	1.0
MSA-13						
107	Asphalt (64-22)	78,000	(3)	--	--	--
120	**Out-of-Service**	2,800	--	--	--	--
134	Asphalt VTB/64-22	80,000	(3)	--	--	--
260	Light Distillate	5,100	(5)	--	--	--
262	Dirty VAS Gas Oil	5,100	(5)	--	--	--
263	Slop Oil	5,100	(5)	--	--	--
264	Asphalt	5,100	(3)	--	--	--
265	PMA Base Stock	5,100	(3)	--	--	--
269	MC Base Asphalt	5,100	(3)	--	--	--
601	Asphalt Resins	5,000	(3)	--	--	--
1321	Roofing Asphalt	5,000	(3)	--	--	--
1323	Coating Asphalt	4,512	(3)	--	--	--
1331	PMA Asphalt	5,000	(3)	--	--	--
1332	PMA Asphalt	5,000	(3)	--	--	--
1333	PMA Asphalt	5,000	(3)	--	--	--
1337	**Closed**	2,000	--	--	--	--
1338	**Closed**	2,000	--	--	--	--
2002	**Out-of-Service**	100	--	--	--	--

Table 22 (Cont'd)

Sufficient Freeboard Determination

Tank Number	Contents	Maximum Capacity (Bbls)	Tanks Within The Same Secondary Containment Area	Berm Capacity, ft^3		Berm Increase, ft
				Actual	Required	
MSA-14						
136	Asphalt VTB	75,470	136, 138, 140	298,501	550,774	0-1.5
138	Light Distillate	80,456	136, 138, 140	298,501	550,774	0-1.5
140	Heavy Distillate	80,000	136, 138, 140	298,501	550,774	0-1.5
MSA-15						
101	Asphalt VTB	64,000	(3), 101, 1324	380,677	536,955	1.0
1324	Asphalt VTB/64-22	66,590	(3), 101, 1324	380,677	536,955	1.0
MSA-16						
252	Slurry Oil	26,800	252, 253	152,566	194,666	0-0.75
253	Ultra Low Sulfur Diesel	25,000	252, 253	152,566	194,666	0-0.75
MSA-17						
1449	Raw Crude	76,425	1449	489,357	484,781	Completed 2014
MSA-18						
2003	Storm Water	86,000	2003	339,073	584,592	2.67
MSA-19						
2004	Waste Water	54,356	(2)	--	--	--
2005	Waste Water	20,000	(2)	--	--	--
MSA-20						
142	Unleaded Gasoline	55,000	142	307,249	350,391	1.00
143	Unleaded Gasoline	55,000	143	239,117	350,649	2.00
144	Unleaded Gasoline	55,000	144	236,233	350,745	2.00
146	Unleaded Gasoline	80,000	146, 164	343,753	500,009	2.00
164	LUK	10,000	164, 146	343,753	500,009	2.00
MSA-21						
147	Cat Gasoline	80,000	147	374,665	487,306	2.33
148	Unleaded Gasoline	75,900	148	388,989	494,160	1.50
168	Alkylate Gasoline	35,700	168	175,279	224,387	1.50
MSA-22						
501	JP-8	25,700	501	116,997	165,723	2.00
1441	JP-8	35,700	1441	135,219	240,891	1.67

Table 22 (Cont'd)

Sufficient Freeboard Determination

Tank Number	Contents	Maximum Capacity (Bbls)	Tanks Within The Same Secondary Containment Area	Berm Capacity, ft[3]		Berm Increase, ft
				Actual	Required	
MSA-23						
203	Ultra Low Sulfur Diesel	80,000	203	451,740	513,843	0.75
MSA-24						
200	Low Sulfur Diesel	80,000	200, 204	411,045	501,795	1.5
204	Diesel or Jet Fuel	150,000	200, 204	Built to new design 2014	N/A	0
MSA-25						
303	Raw Crude	250,000	303	1,274,103	1,548,297	1.42

[1] Exempt pursuant to 40 C.F.R. 112.1(b).
[2] Exempt pursuant to 40 C.F.R. 112.1(d)(6).
[3] Exempt pursuant to 40 C.F.R. 112.1(d)(8), product will rapidly solidify
[4] Exempt pursuant to 67 FR 47076 dated July 17, 2002.
[5] Information not available at the time of Plan drafting.

Table 22A: Tank Dike Update Implementation Schedule

Year	Tank Dikes
2015	303, 501, 1441
2016	142, 143, 144, 146, 164
2017	70, 69, 68, 67, 147, 148, 168
2018	138, 140, 136, 1470, 1471, 1472, 1473, 1475, 252, 253
2019	2003, 150, 152, 154, 155, 156, 108, 110, 250, 251
2020	202, 126, 255, 254, 257, 256, 111, 101, 1324

Appendix M

Facility Inspection Checklists

Table 23

Equipment Inspection and Testing Program

Facility Component	Action	Frequency/Circumstances
Aboveground container	Test container integrity. Combine visual inspection with another testing technique (non-destructive shell testing). Inspect outside of container for signs of deterioration and discharges, or accumulation of oil inside diked areas.	Following a regular schedule (monthly, annual, and during scheduled inspections) and whenever material repairs are made. API 653 for petroleum storage tanks
Container supports and foundation	Inspection container's supports and foundations.	Following a regular schedule (monthly, annual, and during scheduled inspections) and whenever material repairs are made. API 653 for petroleum storage tanks
Liquid level sensing devices (overfill)	Test for proper operation.	Monthly
Diked area	Inspect for signs of deterioration, discharges, or accumulation of oil inside diked areas.	Monthly
Lowermost drain and all outlets of tank truck	Visually inspect.	Prior to filling and departure.
Effluent treatment facilities	Detect possible system upsets that could cause a discharge.	As per OPDES Permit OK000825
All aboveground valves, piping, and appurtenances	Access general condition of items, such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces.	Monthly
Buried piping	Inspect for deterioration	Whenever a section of buried line is exposed for any reason.
	Integrity and leak testing.	At the time of installation, modification, construction, relocation, or replacement.

Table 24

Monthly Aboveground Tank Inspection Checklist

TANK #: **AREA:**
SERVICE: **YEAR:**

INSTRUCTIONS:

The following checklist is to be completed once per month by operations personnel. If any of the items listed below are not satisfactory - Contact (1st) Chief Inspector (Ext. 6612), (2nd) Safety Dept. (Ext. 6669) or (3rd) Environmental Dept. (Ext. 6601) at once. This checklist is to be located in the control room; return completed form to Chief Inspector each January.

USE: OK - NO ADVERSE CONDITIONS FOUND, NS - NOT SATISFACTORY, NA - NOT APPLICABLE

DATE/ OPERATOR	ATTACHED PIPING	PAINT	FOUNDATION	GROUND SETTLEMENT	PIPING/TANK INSULATION	LEAKS	SAFETY DEVICES	SHELL DISTORTION	SECONDARY CONTAINMENT

Table 24 Cont'd)

COMMENTS:

ATTACHED PIPING - CHECK ATTACHED PIPING AND PIPING COMPONENTS FOR LEAKS, DAMAGE, EXTERNAL

CORROSION, AND STABILITY.

PAINT - CHECK TO INSURE THE PAINT COATING IS IN GOOD CONDITION.

FOUNDATION - CHECK TO INSURE THAT THE FOUNDATION IS NOT CRACKED OR OTHERWISE DAMAGED.

GROUND SETTLEMENT - CHECK TO SEE IF ANY NOTICEABLE SETTLEMENT HAS OCCURRED AROUND THE TANK BOTTOM.

INSULATION - CHECK TO MAKE SURE THE INSULATION IS IN GOOD CONDITION AND INTACT.

LEAKS - CHECK FOR SIGNS OF LEAKING AROUND THE TANK BOTTOM, PIPING, NOZZLES, AND OTHER ATTACHMENTS.

SAFETY DEVICES - CHECK TO MAKE SURE THE SAFETY DEVICES ARE CURRENT AND APPEAR TO BE IN WORKING ORDER.

SHELL DISTORTION - CHECK THE SHELL OF THE TANK FOR ANY VISIBLE SIGNS OF DISTORTION OR CORROSION
SECONDARY CONTAINMENT - CHECK/PREVENT OPEN CONTAINMENT VALVE, FREE PRODUCT ACCUMULATION, EXCESSIVE STORM WATER ACCUMULATION THAT NEEDS TO BE REMOVED (NEED CONTAINMENT FOR CONTENTS OF LARGEST TANK, PLUS ROOM FOR PRECIPITATION)

Operations Signature and Turnover Date:

Appendix N

Example SPCC Personnel Training Program Outline

SPCC Training Program Outline

A. Program Intent

- Federal program for the on-site management and handling of oil, prevention of spills, and proper spill response if a spill should occur. The EPA could inspect the facility for compliance with this SPCC Plan.
- "Oil" includes petroleum-based materials (gasoline, diesel fuel, kerosene, fuel oil, motor oil, hydraulic fluid, used oil, transformer oil, etc.), as well as vegetable oil.
- A "bulk storage container" is a container used to store oil that has a capacity of 55 gallons or more. The definition excludes "oil-filled electrical, operating, or manufacturing equipment."

B. SPCC Plan

- Developed for implementation by facility personnel.
- A copy must be maintained/updated by facility's SPCC Coordinator.
- A copy is available for review by any employees at any time during normal working hours.

C. Training – Who, When, What

- Who: All employees involved in handling and management of any new or used oil.
- When: Minimum initial and annual refresher for all employees involved in oil handling.
  - Within two weeks of hire for new employees involved in oil handling.
  - If/when facility oil handling changes (so the SPCC Plan must be updated).
- What: Initial: Entire SPCC Plan.
  - Annual Update: Known spill events or failures, malfunctioning components.
  - Ongoing: Facility changes, recently developed precautionary measures.

D. SPCC Coordinator

- Responsible for SPCC Plan implementation and oil spill prevention at the facility; see the SPCC Coordinator if there is ever any question or concern.

E. General Facility Layout, Site Plan and Drainage Systems

- Provide an understanding of general facility operations, the overall facility layout, surface drainage discharge locations and directions, sensitive receiving water bodies, etc.
- Explain figure(s) showing the locations in which oil is kept in bulk storage containers having individual capacities of 55 gallons or more.

F. Facility's Specific Oil Handling Inventory

Also applies to:

- Gauges, alarms, and leak detection systems.
- Piping systems.
- Oil-filled electrical, operating, and manufacturing equipment.
- Oil unloading/loading areas.
- Additional oil storage or handling activities.

G. Containment and/or Diversionary Structures or Equipment to Prevent a Discharge

- Specific facility measures provided, as per the SPCC Plan.
- Important because spilled oil will flow in accordance with drainage paths.
- Intent of program is to keep oil out of surface water, storm water and drainage features.
- Review operation and maintenance of all equipment intended to prevent discharges.

H. Facility Drainage

- Management of drainage from diked areas.
- Drainage from undiked areas.
- Potential impact on surface waters.

I. Facility Transfer Operations, Pumping and In-Plant Processes

- Operation and maintenance measures to prevent discharges.

J. Bulk Unloading/Loading Areas

- Spills from inbound/outbound transfers, including direction of flow.
- Transfers must be visually monitored at all times.
- Immediate response must be made to any spill, per the Plan's spill response procedures.

K. Inspection and Tests

- Comprehensive monthly visual inspection of each AST, with documentation.
- As a best practice, preferably also monthly visual inspections of drums and larger portable containers, hydraulic system reservoirs, oil-filled transformers, and spill cleanup supplies.
- Prompt completion of required repairs, with documentation.
- Periodic integrity testing of tanks.

L. Security

- General facility security measures and localized measures for individual oil handling areas.

M. Spill Response Procedures

- Need to watch for, report, and clean up spills.
- Spill response equipment, inventory, minimum amount to be maintained, replenishment of used materials, etc.
- Review understanding of spill equipment, intent and how to use/deploy it; supplemented with construction equipment if necessary, etc.
- Spill reporting requirement to Federal and State agencies.

N. Additional State Requirements

- Petroleum Bulk Storage Program
- Used oil requirements

O. Miscellaneous

- Describe and review past discharges, reasons or causes, procedures to prevent recurrence, etc.
- Describe and review any other equipment failures, malfunctioning components and any recently developed precautionary measures relative to oil handling and spill control.

P. General Rules

- Do not wait for problems or spills to occur.
- Keep eyes open, anticipate problems and take precautionary measures to prevent incidents.
- Report all identified or suspected concerns.

Q. Questions

Appendix O

Emergency Contacts

A list of contacts is maintained in the refinery's Integrated Contingency Plan. That list is reproduced here.

III.2.a **<u>Internal Notification</u>**

V.P. REFINING: MIKE SWANSON MOBILE: 620-870-8393 WORK: 405-665-6619

SAFETY:	DAVID MUNSEY	MOBILE: 405-207-1562	WORK: 405-665-6670
	SHANE STEHR	MOBILE: 405-268-2712	WORK: 405-665-6584
E.R.T. CAPTAINS:	ROBERT BOLDING	MOBILE: 580-369-8941	
	WOODY HOBBS	MOBILE: 580-369-8111	
	COLT PRUITT	MOBILE: 580-491-9950	
	ERICK RACHEL	MOBILE: 405-207-8217	
	TOBY MAY	MOBILE: 405-207-1126	
OPERATIONS:	JEFF DANIELSON	MOBILE: 405-313-9726	WORK: 405-665-6691
	BILL MCANGUS	MOBILE: 405-207-7869	WORK EXT: 6551
	JEFF DANIELSON	MOBILE: 405-313-9726	WORK EXT: 6691
	CHRIS GREEN	MOBILE: 405-207-3844	WORK EXT: 6628
	KYLE MCCURTAIN	MOBILE: 580-247-5002	WORK EXT: 6751
	MITCH UNDERWOOD	MOBILE:	WORK EXT: 6552
	TROY STEPHENSON	MOBILE: 405-207-1679	WORK EXT: 6579
	TONY GRAVES	MOBILE:	WORK EXT: 6558
MAINTENANCE:	RAY HANKINS	MOBILE: 405-268-2526	WORK EXT: 6608
	MARK DAVIS	MOBILE: 405-207-3226	WORK EXT: 6789
	JIM HARDY	MOBILE: 405-207-3961	WORK EXT: 6761
	DAN FLAKE	MOBILE: 620-870-9511	WORK EXT: 6790
	DAVID MOSHER	MOBILE: 405-795-3429	WORK EXT: 6614
	ERIK AMPARANO	MOBILE:	WORK EXT: 6595
	COLBY WHEELER	MOBILE: 901-277-4818	WORK EXT: 6660
	CHRIS WINTERS	MOBILE:	WORK EXT: 6569
	ROBERT DELAPLAIN	MOBILE:	WORK EXT: 6581
	LARRY CRADDOCK	MOBILE: 405-207-6289	WORK EXT: 6633
	KENNEY LOWERY	MOBILE: 405-207-0331	WORK EXT: 6616
	STEVE COBBERLY	MOBILE:	WORK EXT: 6617
TECH. SERVICES:	STEVE GEORGE	MOBILE: 405-830-1976	WORK EXT: 6624
	RICK SAGER	MOBILE: 405-317-4039	WORK EXT: 6623
ENVIRONMENTAL:	SIDNEY CABBINESS	MOBILE: 918 636-6265	WORK EXT: 6601
	EVAN HILBURN	MOBILE:	WORK EXT: 6515
PERSONNEL:	SUSAN HURLEY	MOBILE: 405-343-9132	WORK EXT: 6652

SUN OIL PIPE LINE	24 HOUR	800 722-2606
TOTAL PIPE LINE	24 HOUR	800 437-7366
WILLIAMS PIPELINE	24 HOUR	918 573-2000

TRANSOK (Enogex)	24 HOUR	800 324-2044
PEC	24 HOUR	580 332-3031
OG&E	24 HOUR	800 522-6870
BNSF RAILROAD EMERGENCY	24 HOUR	800 832-5452
ARBUCKLE WATER CONSERVANCY	24 HOUR	580 369-3121
CALL OKIE	24 HOUR	800 522-6543
NATIONAL WEATHER SERVICE	24 HOUR	405 573-8800
REGIONAL WEATHER	24 HOUR	405 478-3377

<u>Community Notification</u>

GARVIN COUNTY SHERIFFS DEPT 405 238-7591
Sheriff: Larry Rhodes FAX 405 238-3224
201 W. Grant Street
Pauls Valley, Ok 73075

MURRAY COUNTY SHERIFFS DEPT 580 622-5106
Sheriff: Darin Rogers FAX 580 622-3804
700 w. 1Oth Street
Sulphur, Ok 73086

CITY OF WYNNEWOOD POLICE DEPT 911
CITY OF WYNNEWOOD FIRE DEPT 911
PAULS VALLEY AMBULANCE 911

LEPC COORDINATOR GARVIN CO. H.D.(Bud) Ramming OFFICE 405 238-1148
P.O. Box 237
Pauls Valley, OK 73075

LEPC COORDINATOR MURRAY CO. Norman Shiplett OFFICE 580 369-3333
308 S 6th St.
Davis, OK 73030

III.2.c <u>Federal and State Agency Notification</u>

NATIONAL RESPONSE CENTER 800 424-8802

U. S. EPA REGION VI AREA ON-SCENE COORDINATOR 214-665-2222

U.S. EPA REGION VI OKLAHOMA CITY AREA OFFICE 405 231-5351
IF NO ANSWER 800 321-6742

STATE EMERGENCY RESPONSE CENTER 405-521-2481
OKLA HIGHWAY PATROL (ARDMORE)(F Troop) 405 223-8800
OKLA. CORP. COMMISSION PIPELINE SAFETY FIELD OPERATIONS 405-5212258
WYNNEWOOD RESPONSE ZONE, DISTRICT III
DISTRICT MANAGER, Gayland Darity 580 255-0103
Cell: 405 660-1989
OCC SAFETY SPECIALIST, EAST GARVIN CO. Don Frazier 580 255-0103
Cell: 580 656-0143
OCC SAFETY SPECIALIST, WEST GARVIN CO. Bobby Ramirez 580 255-0103
Cell: 580 281-0807

III.2.d **<u>Oil Spill Notification</u>**

For any oil spill, anywhere on WRC property

III.2.d.i Internal Notification and Call Out

WRC PERSONNEL RECEIVING SPILL REPORT

Upon discovery of, or when a report is made of a spill notify the following people:

SHIFT SUPERVISOR:		24 HOUR	405 665-6556

OR ASK GATE GUARD TO CONTACT SHIFT SUPERVISOR BY RADIO

QUALIFIED INDIVIDUAL/INCIDENT COMMANDER NOTIFIES THE FOLLOWING PEOPLE

VICE PRESIDENT, REFINING:	MIKE SWANSON	WORK	405-665-6619
		MOBILE	620-870-8393
OR			
MANAGER, OPERATIONS:	JEFF DANIELSON	WORK	405-665-6691
		MOBILE	405-313-9726
OR			
MANAGER, TECHNICAL SERVICES:	STEVE GEORGE	WORK	405-665-6624
AS NEEDED:			
ZONE 4:	BILL MCANGUS	WORK	405-665-6551
		MOBILE	405-207-7869
MANAGER, MAINT:	RAY HANKINS	WORK	405-665-6608
		MOBILE	405-268-2526
MANAGER, ENVIRONMENTAL:	SIDNEY CABBINESS	WORK	405-665-6601
MANAGER, SAFETY AND SECURITY	DAVID MUNSEY	WORK	405-665-6670
		MOBILE	405-207-1562

III.2.d.ii AS NEEDED: Community Notification

LOCAL OIL SPILL RESPONSE CONTRACTORS:

DIXON CONSTRUCTION		DAYTIME	405 665-5515
		SHOP	405 665-5410
		24 HOUR	405-268-1400
HYDROCHEM Brock Bagby		MOBILE	316-746-8142
ACTION ENVIRONMENTAL, WILSON, OK		24 HOURS	888-890-2597

LOCAL MUNICIPAL AGENCIES

GARVIN COUNTY SHERIFFS DEPT	Larry Rhodes		405 238-7591
MURRAY COUNTY SHERIFFS DEPT	Darin Rogers		580 622-5114
LEPC COORDINATOR GARVIN COUNTY	H.D, (Bud) Ramming		405 238-1148
LEPC COORDINATOR MURRAY COUNTY	Norman Shiplett		580 369-3333

III.2.d.iii AS NEEDED: Federal and State Notification

NATIONAL RESPONSE CENTER		24 HOURS	800 424-8802
OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY		24 HOUR	800 522-0206
OKLAHOMA CORPORATION COMMISSION FIELD OPERATIONS, WYNNEWOOD RESPONSE ZONE, DISTRICT III DISTRICT MANAGER	Gayland Darity	DAYTIME	405 255-0103

III.2.d.iv AS NEEDED: Other Oil Spill Response Notification

Government

GARVIN COUNTY HEALTH DEPARTMENT	DAYTIME	405 238-7346
MURRAY COUNTY HEALTH DEPARTMENT	DAYTIME	405 622-3716
OKLAHOMA DEPARTMENT OF WILDLIFE MANAGEMENT	DAYTIME	405 521-3719

Qualified Spill Contractors

FOLLOWING IS A LIST OF SPILL RESPONSE CONTRACTORS AND GENERAL CONTRACTORS THAT ARE QUALIFIED AND WHO HAVE AGREED TO RESPOND TO A WRC OIL SPILL.

ACME PRODUCTS COMPANY, INC. P.O. BOX 582015 2666 NORTH DARLINGTON TULSA, OK 74158	24 HOUR	918 836-7184
SOONER EMERGENCY SERVICE 2244 N. 32ND MUSKOGEE, OK 74401	24 HOUR	918 683-2936
GARNER ENVIRONMENTAL, HOUSTON, TX	24 HOUR	713 930-1200

General Contractors

STEVE'S TRUCKING, PAULS VALLEY, OK	24 HOUR	405 238-2322
HAMMER CONSTRUCTION, LINDSAY, OK	DAYTIME	405 756-4386

III.2.e **<u>Hazardous Substance/Materials Incident Notification</u>**

For any Hazardous Substance/Materials Incident, anywhere on WRC property

III.2.e.i Internal Notification and Call Out

WRC PERSONNEL RECEIVING SPILL REPORT

Upon discovery of, or when a report is made of, a Hazardous Substance/Materials incident, see Section II for detailed instructions.

SHIFT SUPERVISOR:		24 HOUR	405 665-6556

OR ASK GATE GUARD TO CONTACT SHIFT SUPERVISOR BY RADIO

QUALIFIED INDIVIDUAL/INCIDENT COMMANDER

VICE PRESIDENT, REFINING:	MIKE SWANSON	WORK	405-665-6619
		MOBILE	620-870-8393

IF UNABLE TO REACH THE ABOVE INDIVIDUAL THEN NOTIFY

MANAGER, OPERATIONS:	JEFF DANIELSON	WORK	405-665-6691
		MOBILE	405-313-9726

-OR

-MANAGER, TECHNICAL SERVICES:	STEVE GEORGE	WORK	405-665-6624

ALSO

MANAGER, SAFETY AND SECURITY:	DAVID MUNSEY	MOBILE	405-207-1562

E. R. TEAM CAPTAINS	“Red Alert™” system
E. R. TEAM	“Red Alert™” system

III.2.e.ii IF NEEDED: Community Notification and Call Out

CITY OF WYNNEWOOD		
FIRE DEPARTMENT		911
POLICE DEPARTMENT		911
LEPC COORDINATOR, GARVIN COUNTY	H.D.(Bud) Ramming	405 238-1148

III.2.e.iii IF NEEDED: Federal and State Notification and Call Out

NATIONAL RESPONSE CENTER		24 HOURS	800 424-8802
OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY		24 HOUR	800 522-0206
LEPC COORDINATOR, MURRAY COUNTY	Norman Shiplett		580 369-3333

III.2.f <u>Fire and/or Explosion Notification</u>

For any Fire and/or Explosion, anywhere on WRC property **SEE SECT II THE CORE PLAN**

III.2.f.i Internal Notification and Call Out

FOR ALL FIRES/EXPLOSIONS		**24 HOUR**	**6666**

SHIFT SUPERVISOR: 24 HOUR By refinery radio channel 1 or by phone: **405 665 6556**

QUALIFIED INDIVIDUAL/INCIDENT COMMANDER

VICE PRESIDENT,			
REFINING:	MIKE SWANSON	WORK EXT	6619
		MOBILE	620-870-8393

AFTER REACHING THE ABOVE INDIVIDUAL OR UNABLE TO REACH THE ABOVE INDIVIDUAL THEN NOTIFY

MANAGER,			
OPERATIONS:	JEFF DANIELSON	WORK EXT	6691
		MOBILE	405-313-9726
AND			
MANAGER,			
TECHNICAL SERVICES:	STEVE GEORGE	WORK EXT	6624
ALSO			
MANAGER,			
SAFETY AND SECURITY:	DAVID MUNSEY	MOBILE	405-207-1562
E. R. TEAM CAPTAINS			“Red Alert™” system
E. R. TEAM			“Red Alert™” system

III.2.f.ii IF NEEDED: Community Notification and Call Out

CITY OF WYNNEWOOD		
FIRE DEPARTMENT		911
POLICE DEPARTMENT		911
LEPC COORDINATOR, GARVIN COUNTY	H.D.(Bud) Ramming	405 238-1148

Appendix P

Discharge Response Equipment Inventory

Facility Response Equipment List

All of the following equipment is inspected and maintained on a regular monthly schedule.

Description	Quantity	Stored Location

Apparatus

- **1986 Mack/Pierce Rescue Pump** — Fire Station #1
  - 1500 gpm Pierce onboard fire water pump
  - 750 gallon tank w/ 1% by 3% Thunderstorm™ AFFF foam
  - 2 pre-connect crosslays 3”x2 ½” connector,
    with 100’ of 2 ½” hose, 2.5” gated wye to
    200’ of 1 ½” fire hose w/ Quadracup™ nozzles
  - 3”x2 ½” fire hose — 300’
  - 5” w/Storz LDH fire hose — 500’
  - Task Force Tip “Hurricane™” remote deck cannon w/ 1250 gpm nozzle
  - On board tool boxes:
    - Blitzfire XXC-33 Oscillating monitor package — 2
    - 5” Storz x 5” Storz x 4 2 ½” MNST Water Thief — 1
    - Assorted nozzles, fittings and adapters
- **1990 Chubb-National GMC foam pumper** — Fire Station #1
  - 1250 gpm Hale pump — 1
  - 1000 gal foam tank w/ 1% by 3% Thunderstorm Foam — 1
  - 1500’ of 2 ½” and 1 ½” fire hose
  - On board tool boxes:
    - Blitzfire XXC-33 Oscillating monitor package — 1
    - 5” Storz X 5” Storz x 4 2 ½” MNST Water Thief — 1

Fire Apparatus Appliances & Hose

Description	Quantity	Stored Location
5” Storz x 6” FNST Rigid Rocker lug adaptor	2	Firewater Pump House
5” Storz x 5” Storz x 4/2 ½” MNST Water Thief	2	Firewater Pump House
50’ 5” hose with Storz™ fittings	4	Firewater Pump House
25’ 5” hose w/ Storz™ fittings	4	Firewater Pump House

Foam Systems (Fast Attack ¾ ton Pickups)

- Skid mounted Daspit™ Mount 1500 gpm self-educating nozzle
- 100 gallon foam tank

Foam trailer (2 15/16th” ball) — 2

- with 4” waterway, Daspit Mount 1500 gpm self-educating nozzle
- 4 totes 265 gallons 1/3% Thunderstorm firefighting foam — Fire Station #1

Unit Initial Response Team Fire Equipment (Fast Attack Trailers)

• Duraworx Deluxe Garden Dart	12	Fire Houses 1-6
• 3"x 2 ½"High-Tech™ 500 rubber fire hose	36	Fire Houses 1-7
• TFT AC5ANJ-NJ Hydrant Valve 2 ½" gate valves	12	Fire Houses 1-8
• TFT XX-32 Blitzfire Monitor	12	Fire Houses 1-9
• 2 Wheel Monitors 350 gpm nozzle	3	Safety Building
• 2 Wheeled Monitor w/ 350 gpm nozzle	1	ALKY Operator Shelter

Fire Hose & Appliances

• LDH trailer	1	Fire Station #1
o 5" soft suction Storz connector 100 ft sections	30 joints	
o 5" soft suction Storz connector 50 ft sections	10 joints	
o H800-50-50-ST 5" Gate Valve	4	
o H400-50-50-25NH Distribution Valve	4	
o H30E-50-40NH 5" Storz to 4" NH hose adaptor	4	
o H800-50-40NH 5"x4" Gate Valve	4	

Rescue/Medical

• Cardiac Science Automatic AED	8	
• PLS 1014 Blood Borne Pathogen/ Personal Protection Kit	6	Fire Station #1

HazMat

PPE

• 14" Wells Cargo Trailer		Fire Station #1
o Tychem TK Level A suits 2-L &2-XL	4	
• **Respiratory Protection**		
• 14" Cargo Trailer		Fire Station #1
o 1 hour SCOTT Air-Pak 50 units	16	
o 1 hour SCOTT Air-Pak 50 spare bottles	16	

• **Absorbent**

• Boom 402 8"x 20' 2 boom per bag	25	Spill Response Building
• MAT 405-01 50'x17"	20	Spill Response Building
• PIG403 Mops on 50' rope	20	Spill Response Building
• RNG202 Absorbent Wringer	1	Spill Response Building
• 100'x 6"x 12" floating skirted boom	4	Spill Response Building
• Tow Bridle for floating skirt boom	8	Spill Response Building

Spill Response Heavy Equipment (Available on-site)

• Vacuum Truck	1	South of Maintenance Bldg
• Backhoe	1	Old Zone 1 Op Shelter
• Winch Trucks	2	Pipefitter's Shop
• Compressors (Mobile air compressors)	2	Pipefitter's Shop

- **Hand Tools** Storage location: SPCC Building
- 3 shovels
- 6 squeegees
- Chicken wire

- **Hand Tools** Storage location: Warehouse/Tool Room
- The refinery tool room, warehouse, and machine shop maintain inventories of air hose, fire hose, chemical hose, hand tools, power tools, and shop tools.

- **Personal Protective Equipment** Storage location: SPCC Building
- Rubber boots
- Chest-high waders
- Gauntlet gloves
- Face shields

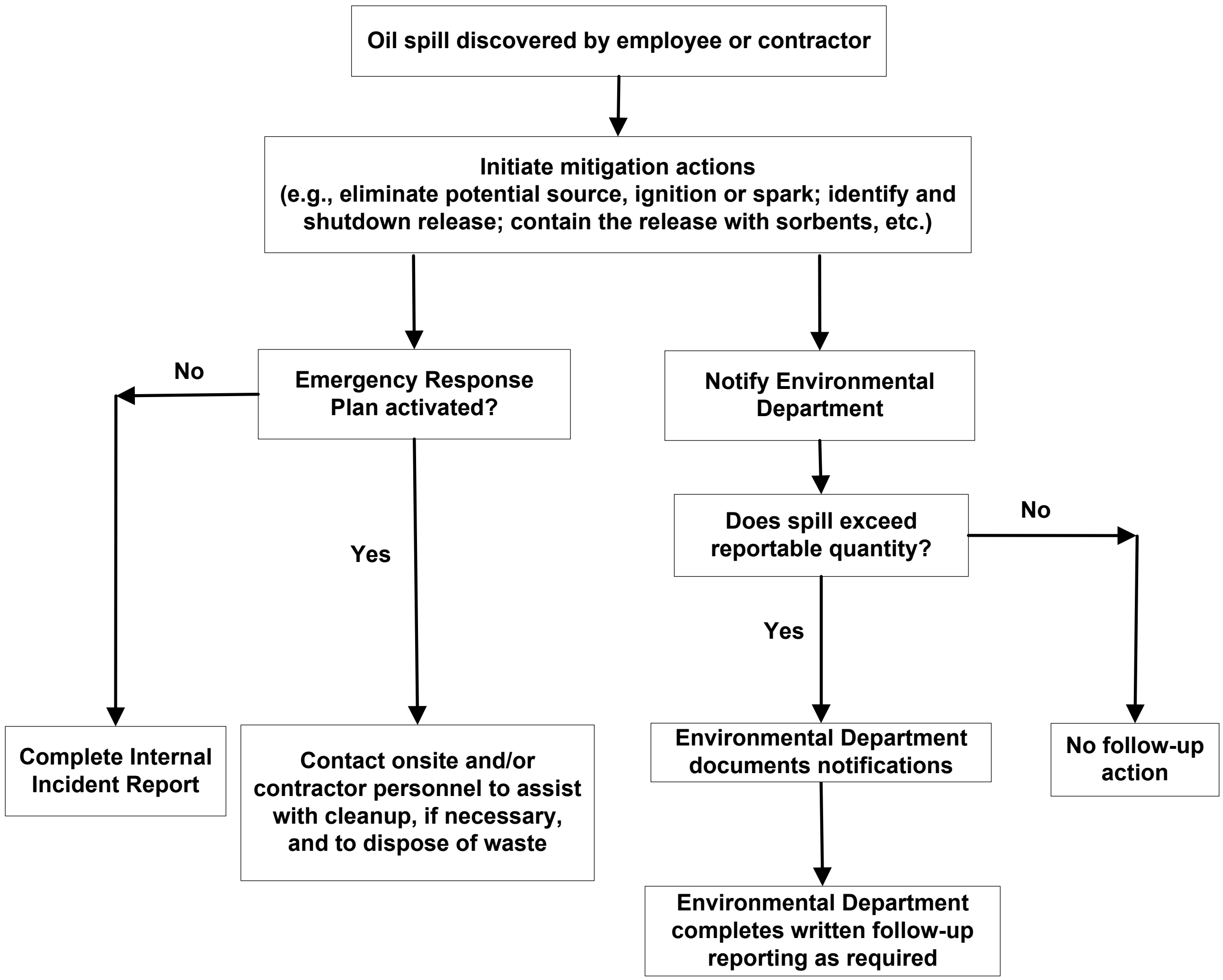
- **Personnel Protective Equipment** Storage location: Warehouse/Tool room
- Rubber boots
- Chest-high waders
- Gauntlet gloves
- Face shields
- Chemical splash suits
- Goggles

Communication Equipment

- Refinery Emergency Alert Notification System
- Refinery telephone system, phones located in all local control rooms and the pipeline office
- UHF & VHF two-way radios[3]; 6 repeaters
- Cellular telephones

Appendix Q

Discharge Notification Procedures & Forms



ENGlobal®

COUNTERMEASURES FOR DISCHARGES
WYNNEWOOD REFINING COMPANY, LLC
PARTS OF SECTIONS 14, 23, AND 24, TOWNSHIP 2 NORTH, RANGE 1 EAST, WYNNEWOOD, GARVIN COUNTY, STATE OF OKLAHOMA.

SCALE: NOT TO SCALE	DATE: 09/25/13	FIGURE NO. FIGURE 24
APPROVED BY: DME	DRAWN BY: PCJ	PROJECT NO. 10-130458

RQ RELEASE NOTIFICATION FORM

Release Date______________________ Time began, duration (or ongoing)_______________

Material(s) released & estimated qty (or potentially >RQ) or release rate:__________________
(H_2S, SO_2, HF are listed by EPA as Extremely Hazardous Substances)

Responsible for release:
Wynnewood Refining Company
906 S. Powell, Wynnewood, OK
Garvin County

Source/location of release (e.g., flare):____

Medium released to (air, land, water): ____

Event Description/Cause (e.g.. planned/unplanned maintenance, non-emergency situation):

Corrective Measures/Precautions taken (e.g., sulfur shedding/minimization, reduced charge/production rate):

Any medical attention necessary or acute/chronic health risks associated with release?

LEPC Contact: Bud Ramming, 405 331-9222
Time notified:__________________

SERC Contact/DEQ Hotline: 800 522-0206 (405 627-3527) Name of DEQ Contact:_____________

Time notified:_________________

NRC: 800 424-8802 Name of NRC Contact:_______________ NRC report No:___________________

Time notified:_________________________ Weather conditions:_______________________

Notifications made by: _______________________ Phone No._______________________