

**PRELIMINARY HYDROLOGY, DETENTION, AND
WATER QUALITY ANALYSIS**

FOR

WALMART #1941 EXPANSION

LOCATED AT

SEC OF AUTO CENTER DR AND LONE HILL AVE

CITY OF GLENDORA, CALIFORNIA

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SECTION 1.0

NARRATIVE

Introduction

Project Description

Hydrology Methodology

Detention Methodology

SUSMP Analysis

Conclusions/Recommendations

Introduction

The project is located on approximately 13.3 acres of developed land at the SEC of Auto Center Drive and Lone Hill Avenue, in the City of Glendora, Los Angeles County, California. The proposed project will include the expansion of an existing WalMart store and the reconstruction of the main parking lot in-front of the building. This report has been prepared to calculate the pre and post construction condition for the on-site storm water runoff and to make recommendations for the on-site detention system and storm water treatment design.

Project Description

Existing Site Conditions: The existing site consists of a WalMart building, parking, landscaping, storm drain network, and above ground detention basin. The site currently conveys all on-site runoff into an underground storm drain network to a diversion manhole located along the western portion of the site, south of the existing detention basin. The diversion manhole splits the on-site runoff to either the existing public storm drain facility located west of the project or into the existing on-site, above ground detention basin located in the north-west corner of the project. The detention basin discharges into the existing public storm drain facility through a metered outflow device. The existing detention system was designed and approved to discharge the specified metered flow rate. The existing site has a watershed area of approximately 13.3 acres and is 82% impervious surface. The existing site is not located in a FEMA designated flood hazard area.

Proposed Site Development: The proposed site consists of an approximate 30,000 square foot expansion of an existing WalMart building, demolition and reconstruction of the front parking field, loading dock relocation, and other minor site revisions throughout the project. The proposed site will maintain the existing drainage discharge pattern of the site. The proposed project will divide the site into two drainage areas (Areas A and B on the Proposed Hydrology Map). Drainage Area A will collect runoff from the front parking field (7.1 acres) and discharge the flows directly into the detention basin located at the north-west corner of the project. The improvements to Drainage Area A will reduce the impervious surface ratio to 78%. Drainage Area B will collect runoff from the building roof, recessed loading dock, and back drive aisle areas (6.3 acres). Drainage Area B is collected in roof drains and storm drain inlets and conveyed to the existing on-site diversion manhole. At the diversion manhole, the flows are discharged to the public facilities at a metered rate or diverted to the on-site detention basin. The improvements to Drainage Area B will increase the impervious surface ratio to 89%.

Hydrology Methodology

The hydrology calculations for the project are based on the LA County Department of Public Works (LADPW) Hydrology Manual (January 2006 edition). Location maps, precipitation values, and soil values have all been interpolated from the LADPW Manual and can be found in Section 2.0 of this report. Proposed site conditions are analyzed using the LA County Time of Concentration (Tc-Volume) spreadsheets to produce pre-construction and post-construction flow rates/volumes and to generate hydrographs for the 25-Year storm event. See Section 4.0 for calculations. The 25-Year storm event is being for the design storm in accordance with LA County Hydrology Manual Urban Flood Protection requirements.

Existing Conditions: The hydrologic analysis for this site was performed by analyzing the existing site as a single tributary drainage area (Drainage Area E). See the Existing Hydrology Map in Section 3.0. The results of the Drainage Area E analysis are located in Section 3.0 and are summarized in the table below.

DRAINAGE AREA E SUMMARY TABLE

Storm Year	Peak Area Discharge	Area Discharge Volume	Time of Concentration
25	27.62 cfs	5.50 acre-feet	14 minutes

Proposed Conditions: The hydrologic analysis for this site was performed by dividing the proposed site into two tributary drainage areas (Drainage Area A and Drainage Area B). See the Proposed Hydrology Map in Section 4.0. The results of the Drainage Areas A and B analysis are located in Section 4.0 and are summarized in the table below.

DRAINAGE AREAS A AND B SUMMARY TABLE

Drainage Area	Storm Year	Peak Area Discharge	Area Discharge Volume	Time of Concentration
A	25	19.18 cfs	2.83 acre-feet	8 minutes
B	25	13.68 cfs	2.76 acre-feet	13 minutes

Detention Methodology

The existing site is designed (Drainage Report WalMart Store Site City of Glendora, June 1993, Hall & Foreman, Inc., Attached as Appendix A) to detain the 50-Year storm event down to a defined discharge rate of 13.2 cfs. Hydraulic and Detention analysis for the existing site was modeled using Rational Method Hydrology for Los Angeles County by Advanced Engineering Software. The previous detention study results in a required detention volume of 0.513 acre-feet, or approximately 22,350 cubic feet of storage.

In accordance with the LA County Department of Public Works (LADPW) Hydrology Manual (January 2006 edition), the proposed site does not meet the standards for requiring Capitol Flood Protection levels (50-Year event). Due to the existence of an overland release path onto Lone Hill Avenue and Auto Center Drive and a freeboard level in excess of 1', the minimum site requirements is to satisfy the Urban Flood Protection level (25-Year event). Based upon the 25-Year design storm requirement, the required minimum detention volume for the site is approximately 10,800 cubic feet. The minimum detention volume is estimated by calculating the volume of runoff generated above the peak 13.2 cfs discharge rate of the site.

In addition to the required volume to detain the site runoff down to a metered discharge of 13.2 cfs, the relationship between the pre-construction and post-construction flow rates was analyzed. Due to the minor increase in the amount of impervious surface (from 82% site average to 83%) and the minimal impacts to the existing drainage paths (site Tc values are to remain the same), the differences in the pre-construction and the post-construction site generated flow rates are expected to be negligible.

SUSMP Analysis

The existing site currently directs all on-site 'first flush' runoff into the public storm drain facilities located west of the project. High flows in the system are directed towards an open above ground detention basin that serves as an infiltration system and provides contact with existing vegetation. The detention basin discharges into the public storm drain facilities.

In the proposed site, the site stormwater is divided into two drainage areas. See Proposed Hydrology Map in Section 4.0. Drainage Area A includes the main parking lot in front of WalMart and will include the majority of vehicular traffic. The revised parking configuration and grading of Area A will direct runoff from the parking field into the landscape areas. These landscape areas will act as infiltration basins and landscape swales to remove pollutants. After passing through the landscape areas, the runoff will be discharged directly into the above ground detention basin. Drainage Area B includes the roof, loading dock, and back drive aisles of the site. Roof runoff will be filtered using down spout filter inserts. Drainage Area B will discharge 'first flush' runoff into the public storm drain facilities located west of the project and higher flows will be directed into the existing detention basin. From the detention basin, the stormwater will be discharged into the public storm drain facilities.

Conclusions/Recommendations

Based upon the preliminary design prepared by Kimley-Horn and Associates, the proposed site has sufficient capacity to detain the design storm event discharge rate down to the existing peak rate. Based upon the minor proposed alterations to the site (1% increase in pervious area ratio and maintaining existing drainage patterns) and the existing site meeting agency discharge requirements, the proposed site improvements will not impact the existing downstream facilities.

The proposed treatment of water quality will substantially improve the existing stormwater treatment capacity and will treat the areas impacted by this development. The additional roof area, and existing roof area, will be treated by filter inserts in the roof downspouts. The reconfigured parking field in front of the Wal-Mart store will be treated by the landscape infiltration basins. However, runoff from the existing undisturbed impervious areas will continue to not receive any significant stormwater treatment.

Based upon the preliminary plans, DRC has the following recommendations:

- In final design verify the sizing of meter orifices for controlling correct flow rates for discharge from site.
- Divert collected runoff from landscape infiltration basins to diversion manhole and divert runoff from untreated areas and roof/loading dock runoff directly to the detention basin. This will allow for treatment of currently untreated runoff with minimal cost impacts.
- Install proprietary treatment device in main storm drain line conveying the untreated areas/roof runoff/loading dock discharge.

In response to specific questions posed for the Environmental Impact Report:

- Violate any water quality standards or waste discharge requirements?

The proposed project is designed to treat runoff from the disturbed/impacted areas of the project. These treatment measures will require final sizing calculations in final design. The project has capacity for additional treatment.

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level?

The proposed site maintains the existing infiltration rates by minimal impacts to the amount of impervious surface (83% proposed impervious ratio versus 82% existing impervious ratio) and promoting infiltration through the use of specifically designed infiltration areas.

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

The proposed site does not alter the existing drainage pattern of the existing site and the site has the capacity to detain stormwater runoff to existing flowrates, as well as predetermined discharge limits. On-Site or Off-Site flooding will not be impacted by these improvements. This project does not alter a stream or river.

- Create or contribute runoff water which would exceed the capacity of the existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

The proposed site will discharge at existing levels which was determined in the original development of the project to be within acceptable discharge rates to the public infrastructure. The proposed site will reduce the amount of polluted runoff and will not create any new pollutants.

- Otherwise substantially degrade water quality?

The proposed site will not impact stormwater quality from a hydraulic standpoint and will improve stormwater quality from a pollutant standpoint.

- Place a housing project within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

The proposed building expansion will be at the same elevation as the existing building which is not located in a flood hazard area. FEMA maps show that this project is not within a flood hazard area.

- Place within a 100-year flood hazard area structures which would impede or direct flood flows?

The proposed structure will not impede or direct flood flows in a flood hazard area.

- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

The proposed project is not located within a flood area nor is it shown by FEMA to be protected by a levee or dam.

- Inundation by seiche, tsunami, or mudflow?

The proposed project is not located near a substantial body of water to generate a seiche or tsunami. The project is not located adjacent to any area with substantial potential of mudflow onto the property. The site is located in a highly developed area.

- Potentially impact storm water runoff from construction activities?

The proposed construction will be required to meet NPDES discharge requirements including the control of sediment runoff and erosion through the use of BMPs. These BMPs will be outlined in the SWPPP document prepared in final design.

- Result in a potential for discharge of storm water pollutants from area of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas, loading docks or other outdoor work areas for post-construction activities?

The proposed site will be required to meet pollutant discharge requirements set forth in the Los Angeles County SUSMP. This will include outlining BMPs to mitigate potential discharge of storm water pollutants. A SUSMP report will be prepared and approved in final design to outline these requirements.

- Otherwise result in any other potential impacts to storm water runoff from post-construction activities?

The proposed site will not have any significant impacts to storm water runoff from post-construction activities. A SUSMP will be prepared and approved in final design to outline the steps necessary to meet jurisdictional requirements.

- Substantially increase the flow velocity or volume of storm water runoff to cause erosion or habitat impacts within the project site or downstream?

The proposed site will not substantially increase the flow velocity or volume of storm water runoff and therefore will not cause erosion or habitat impacts within the project site or downstream.

SECTION 2.0

SITE INFORMATION

Location Map

LA County Isohyet Map

FEMA Flood Insurance Rate Map