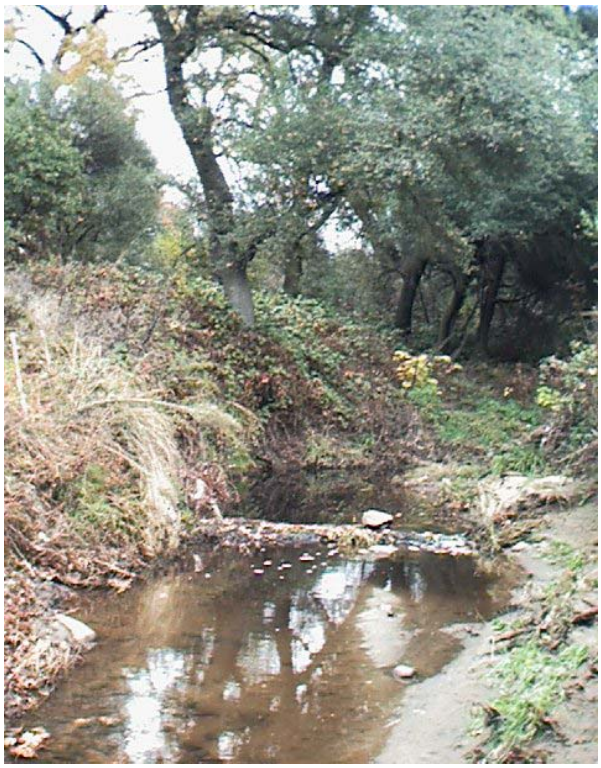

Arcade Creek is the primary east-west waterway that separates land uses in the northern portion of the site from those in the south. The Arcade Creek floodplain varies in width from 120 to 200 feet with fingers of floodplain extending to the north and south.

4.7.1 ENVIRONMENTAL ISSUE

This section of the EIR discusses the impact of the proposed project on both Arcade Creek and San Juan Creek, drainage conditions at the project site and downstream based on the existing physical conditions and development proposed by the applicant. The physical features of the site affect not only project components such as grading and location of structures, but also the resulting impact on drainage from the site.

4.7.2 METHODOLOGY

This section is based on the *Drainage Impact Analysis for Stock Ranch Development* prepared by Morton & Pitalo (August 2000) as well as a peer review technical memorandum of the Analysis prepared by Stantec Consulting, Inc. (September, 2000) (**Appendix F**).

As part of preparing the analysis, Morton & Pitalo developed several hydrologic models using the U.S. Army Corps of Engineers' HEC-1 computer model. HEC-1 models were formulated to simulate existing watershed conditions for Arcade Creek and estimate 10-, 25-, 50- and 100-year peak discharges concentrating along Arcade Creek within Stock Ranch and at key downstream points of concentration. The impacts of site development on downstream peak discharges were then estimated via modified HEC-1 models, which reflected slight increases when compared with existing watershed conditions. Finally, the proposed onsite detention basins, with a combined storage volume of 15.5 acre-feet, where incorporated into the HEC-1 models to determine the degree to which they mitigated against increases in downstream flood peaks.

Morton & Pitalo also used the U.S. Army Corps of Engineers' HEC-RAS computer model to estimate downstream water surface elevations resulting from the occurrence of various peak discharges at key downstream points of concentration.

In those cases where potentially significant impacts have been identified, this section identifies mitigation measures that could reduce the impact. Based on an evaluation of the potential impacts and effectiveness of the mitigation measures, this section then reaches a conclusion regarding the level of significance of such impacts, assuming implementation of the identified mitigation measures.

In addition to the Morton & Pitalo and Stantec studies, the City of Citrus Heights commissioned a "Detention Facility Analysis" by the firm of MHM to analyze various storm detention scenarios. This study does not affect the conclusions of the Morton & Pitalo or Stantec studies, but is included in the appendices as an informational item.

4.7.3 SIGNIFICANCE CRITERIA

The CEQA Initial Study Checklist form has been used to establish impact standards for this section. Implementation of the project would result in significant hydrology and drainage impacts if the project would result in any of the following:

1) Violate any water quality standards or waste discharge requirements.

2) 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 (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

3) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site.

4) 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 that would result in flooding on- or off-site.

5) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

6) Otherwise substantially degrade water quality.

7) Expose people or structures to a significant risk of loss, injury or death involving flooding.

8) Place within a 100-year flood hazard area structures that would impede or redirect flood flows.

4.7.4 EXISTING SETTING AND BACKGROUND

Physical Characteristics and Setting of the Project Site

The Stock Ranch project site encompasses 129 acres within the City of Citrus Heights. A prominent feature of the site is Arcade Creek, one of Citrus Heights' primary waterways, and a smaller creek, San Juan Creek. Arcade Creek enters at the mid-section of the property from the east. All streams in the City generally flow west, draining into Arcade Creek that ultimately drains

into the Sacramento River. Arcade Creek, and associated San Juan Creek, drain the southern portion of Citrus Heights.

Arcade Creek meanders across the site to the western property line as an incised channel with eight foot high, deeply cut banks. It has an average width of 20-feet and is heavily vegetated with trees along its high banks.

A portion of San Juan Creek enters the property from the east through heavy oak woodland tree cover. The creek channel is deeply incised with 8-12 feet high cut banks. The width varies from 12-25 feet with an average of 15-feet. The downstream portion of San Juan Creek converges with Arcade Creek within the Stock Ranch project area. The climate of the Sacramento Valley Area is Mediterranean in character, consisting of wet winters and dry summers. The region's rainy season generally extends from November to March, with relatively dry conditions for the balance of the year.

Site Drainage

The Arcade and San Juan Creeks within the site are key components of the site's storm drainage system. Currently, runoff from the property discharges to both Arcade and San Juan Creeks. The *City of Citrus Heights General Plan Draft Environmental Impact Report* (Citrus Heights, 2000b) noted that Arcade is a primary waterway while San Juan is a smaller creek. Both creeks were analyzed in the Morton & Pitalo Study assuming the full development of the entire property.

All of the storm water runoff from the site as well as the City is eventually discharged to the Sacramento River.

Three tributary drainages on-site feed into Arcade Creek. Two enter from the north and one enters from the south. The tributary drainages on the Stock Ranch property generally consist of a combination of incised channels and vegetated swales with no associated riparian tree cover or with moderate to dense riparian tree cover (General Plan Background Report, 1999). However, there is riparian vegetation associated with the westernmost drainage. There is also riparian vegetation associated with westernmost drainage.

The large tributary drainage, with an average width of eight feet, accesses the site in the north westernmost corner through a culvert under Auburn Boulevard and connects with the downstream end of tributary drainage two before entering Arcade Creek. The second tributary drainage enters the site though a culvert under Auburn Boulevard as a five to eight foot wide vegetated swale and broadens out at the midsection of the site to a 10-foot wide vegetated swale. The third tributary enters at the southern end of the site through culverts, which carry the drainage under paved and developed areas. At its downstream end, the third tributary becomes a three-foot wide incised channel as it joins Arcade Creek.

The large tributary is at the northwest corner of the project. The secondary tributary is at the mid-section of the site, and the third tributary drains the southern portion of the site through culverts. A sedimentation basin carries drainage under paved and developed areas serving south of the creek.

Flooding

Flooding is defined as an overflowing of normally dry land, often after heavy rain. Flooding occurs when the capacities of streams and storm drainage facilities is exceeded. Arcade Creek has a relatively small hydraulic capacity and can be quickly overwhelmed during severe storm runoff events resulting in the overflowing of stream channel banks and the temporary inundation of floodplains and connected low lying areas.

Portions of the project site are located within the 100-year floodplain (FEMA, 1998). The 100-year floodplain is used to identify unacceptable safety hazards and indicates the geographic area having a one percent chance of being flooded in any given year. Portions of the project site adjacent to the creek are within the 100-year floodplain and could increase the flood hazard to adjacent properties. However, certain measures can be proposed to ensure that the proposed development is brought to a less than significant level. There have been previous flooding problems associated with the Arcade Creek. According to Morton and Pitalo, the 100-year base flood elevations for both Arcade Creek and San Juan Creek were determined based on post-development conditions, and then compared with the existing 100-year base flood elevations.

During periods of heavy or prolonged rains, Arcade Creek, below Stock Ranch, reaches levels that cause flooding to streets and structures. During the public input process, many residents recounted personal histories of flooding and asked if the development of Stock Ranch could help reduce their problem. Of particular interest to the residents of Crosswoods, the housing development west of and downstream from the Stock Ranch, is how development will impact them.

The City is provided flood control and management services by the Sacramento County Public Works Agency, Department of Water Resources (SCDWR). The SCDWR has estimated that over 100 residences located near Arcade Creek between Stock Ranch and the west boundary of the City of Citrus Heights would be subject to flooding during a 100-year storm under existing conditions.

Water Quality

Surface Water Quality: Surface water quality is chiefly influenced by surrounding land uses. Urban runoff includes surface drainage from residential and commercial land uses, including landscape irrigation, surface cleaning, swimming pool draining, and other similar activities. Additionally, storm water discharge into the creek system of Citrus Heights conveys precipitation from areas of saturation or impermeable surfaces to low lying collection areas and creeks. These storm water flows in an urban area often includes contaminants collected from surrounding land uses. Both urban runoff and storm water discharges influence the quality of surface water. A sedimentation water quality basin will be constructed on the north side of the creek to cleanse run off before entering the creek.

Arcade Creek has been identified as not meeting the water quality standards for common insecticide (chlorpyrifos) as set forth in the Federal Clean Water Act and has been included in the California 1998 Section 303(d) list maintained by the Environmental Protection Agency (EPA, 1998). The Creek has been identified as a medium priority water body for the development and

implementation of Total Maximum Daily Load (TMDL) standards in order for the creek to achieve water quality standards.

Groundwater Quality: Groundwater quality for the City of Citrus Heights has not been comprehensively documented. The City of Citrus Heights is not included in any known regional plume of gross groundwater contamination and groundwater quality is considered to be good in the City. In a conversation (August 21, 2000) with Mr. Bob Churchill, General Manager of Citrus Heights Water District, he indicated that there is nothing in the records to indicate detriment to the ground water quality. He further mentioned that it is not expected that the proposed development will negatively affect ground water quality.

Water Quality Regulation: Management of surface and groundwater quality in California is the primary responsibility of the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCB). The Central Valley RWQCB implements and enforces water quality regulation on a regional basis for the City of Citrus Heights primarily through the issuance of National Pollution Discharge Elimination System (NPDES) permits and waste water discharge requirements.

Federal, State, and Local Regulations

NPDES Permit: Water quality is regulated nationally by the Federal Water Pollution Control Act (also called the Clean Water Act [CWA]), which since 1972 regulates the discharge of pollutants to waters of the United States from any point source. In 1987 amendments to the CWA added section 402(p), which established a framework for regulating non-point source storm water discharges under the National Pollutant Discharge Elimination System (NPDES) Program (Phase 1). The Phase I NPDES storm water program regulates storm water discharges from major industrial facilities, large and medium-sized municipal separate storm sewer systems, and construction sites that disturb 5 or more acres of land. In December 1999, the Environmental Protection Agency finalized revisions to the Water Pollution Control Program, implementing the Storm Water Program Phase II Final Rule regulations. The Phase II regulations expand the NPDES storm water program to address storm water discharges from small municipal separate storm sewer systems (those serving less than 100,000 persons) and construction sites that disturb one to five acres of land.

The Stock Ranch project is proposed for an area of approximately 129 acres of land and will be required to obtain the NPDES Permit in order to regulate the discharge of storm water from the development once implemented.

NPDES General Construction Activities Storm Water Permit Requirements. The General Construction Activities Storm Water Permit requirements would apply to the Stock Ranch project. In California, the NPDES Storm Water Program is administered by the California Regional Water Quality Control Boards (RWQCB). In the City of Citrus Heights, storm water discharge through the City's municipal system is managed through a joint NPDES Permit with the County of Sacramento and the cities of Sacramento, Folsom and Galt. The joint NPDES permit regulates all wet and dry weather runoff discharge in the County, including the City of Citrus Heights. Management of permit compliance is conducted by the SCDWR. The joint permit requires implementation of a storm water management program including the use of Best Management Practices (BMP).

Pursuant to the NPDES Storm Water Phase II Final Rule, dated December 8, 1999, discharges of storm water associated with construction activities that result in the disturbance of equal to or greater than one acre of land must apply for coverage under the statewide General Construction Activities Storm Water Permit (General Permit). Construction activity includes, but is not limited to: clearing, grading, excavation, construction of new structures, and reconstruction of existing facilities involving removal and replacement that results in soil disturbance. It is the responsibility of the owner of the land where the construction activity is to occur to obtain a permit prior to site construction.

The owner can obtain coverage under the General Permit by filing a Notice of Intent (NOI) with the State Water Resource Control Board's Division of Water Quality Storm Water Permit Unit. Generally, the site is covered by the General Permit upon filing the NOI and submitting the appropriate annual fee. The NOI must be submitted, and the permit obtained, before construction starts.

In addition to submitting the NOI, the project could be required (at the City's discretion under the terms of the NPDES Permit) to develop and implement a Storm Water Pollution Prevention Plan (SWPPP), and develop and implement a monitoring and reporting plan. The SWPPP could include elements to satisfy some or all of the following objectives:

1. To identify pollutant sources that may affect the quality of discharges of storm water associated with construction activity from the construction site;

2. To identify, construct, implement, and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants in storm water discharges from the construction site during construction; and

3. To develop a maintenance schedule for BMPs installed during construction designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs).

The SWPPP could also include an Erosion and Sediment Control Plan outlining specific practices and controls to prevent against erosion. It is not feasible at this time for the State Water Board to establish numeric effluent limitations for pollutants in storm water discharges. Therefore, the effluent limitations contained in the General Permit are narrative and include the requirement to implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) consistent with the water quality protection goals and guidelines of the regions Water Quality Control Plan (Basin Plan) developed by the RWQCB.

California Department of Fish and Game 1601 Permit

Sections 1601-1606 of the California Fish and Game Code affect all activities which may substantially divert or obstruct the natural flow, or substantially change the bed, channel, or bank, of any river, stream or lake. Depending on final project plans, a streambed alteration Permit may be required and would be obtained from the Department of Fish and Game.

U.S. Army Corps of Engineers (ACOE)

Section 404 of the Clean Water Act, *Guidelines for Specification of Disposal Sites for Dredge or Fill Material*, prohibits all discharges of fill material into regulated waters of the United States, unless the discharge constitutes the least environmentally damaging practicable alternative that will achieve the project purpose. The U.S. Army Corps of Engineers is the permitting agency for such activities. If necessary for the project, the ACOE Section 404 permit would likely be granted under an individual permit.

4.7.5 PROJECT IMPACTS AND MITIGATION MEASURES

The proposed project would modify the site land use and runoff conditions. The proposed project would contain up to 590 residential units and up to 570,000 square feet of commercial development. The total drainage area of the project is approximately 109.4 acres. The applicant has proposed constructing stormwater detention and/or storage basins to accommodate run-off water from the site. The estimated amount to be contained from the build out of Stock Ranch is 13.1 acre-feet. Three potential sites for the pond are proposed.

Flooding and Increase in peak runoff rates

Impact 4.7-1: Development of the project site will increase the rate of stormwater runoff, which may exacerbate flood conditions. This is considered a potentially significant impact. Note: This impact can be mitigated to an acceptable level. The project includes on-site detention, so no mitigation is needed. *See discussion below.*

The *City of Citrus Heights Draft General Plan*(2000a) **Policy 48.3** requires that potential flood hazards be evaluated prior to approval of development projects. In keeping with this policy, the flood hazards of the project have been evaluated. HEC-1 water shed modeling reveals that development of the site would increase the peak discharge rate of runoff from the project site. Land use changes in a watershed cause changes to watershed hydrology. Specifically, when impervious surfaces such as rooftops, roads, and driveways are added, the amount of ground surface that would otherwise be available for absorption and infiltration of rainfall is reduced. Consequently, the volume of runoff increases, and the rate at which the runoff flows from the watershed increases. Increased runoff volume and peak discharge rates can create, or exacerbate, downstream drainage problems, increasing flood frequency and duration. In addition, increased peak discharge rates and increased duration of flows (caused by increased runoff volume) can cause, or exacerbate, channel erosion.

Currently, runoff from the Stock Ranch property discharges into the Arcade Creek and San Juan Creek. The peak flow design flows due to the proposed development of the project were calculated using the hydrology standards in the Sacramento City/County Drainage Manual (Volume 2) and the U.S. Army Corps of Engineers HEC-1 water shed modeling program.

The Design Guidelines contained in the Guide acknowledge that the project will require a storm drainage system for collection and release of surface water runoff. In addition, the Drainage Guidelines recognize that the proper detention, conveyance and release of storm water into Arcade Creek is important to avoid additional flooding and to maintain the water quality and aquatic life of Arcade Creek in accordance with the NPDES program. Development Standards

for storm water detention/water quality contained in the Guide require that the storm water system be designed in conformance with generally accepted principles of hydrology and hydraulics and the requirements of the County of Sacramento Department of Water Resources and City of Citrus Heights. Specifically, the Design Guidelines direct detention basins to be located in the southwestern and southeastern quadrants of the property in the Auburn Commerce District. These basins shall be designed as integral elements within the overall open space plan. On-site catch basins may be designed as oil and sediment traps. Each inlet will have a minimum 2' deep sump. The outlet is to be fitted with a tee or elbow on the outlet pipe to retain oils. Two 4" diameter weep holes are to be installed on the floor of each catch basin to allow trapped water to slowly percolate into the surrounding soil. Bi-annual clean out of each catch basin is required to remove trapped oils and sediments.

In accordance with the provisions of the Guide, the applicant has proposed two detention basins to mitigate the increase in the base flood elevations. One basin is proposed adjacent the westerly boundary of the site and will provide mitigation for the site run-off from portions of the proposed commercial development north of the Arcade Creek. The second detention basin will be an off-stream detention basin located within the existing flood-plain/open space adjacent to Arcade Creek. The off-stream basin will provide additional storage of floodwaters within the existing flood plain. The detention basins are designed to have a maximum depth of six feet and variable side slopes may permit passive recreational use depending on the location when not flooded as prescribed in the Design Guidelines. Another optional site for a pond is on the east side of the property immediately north of the creek. A large heritage oak tree is located in this area and should be considered for preservation if this site is selected. Increased depths could e considered provided standards in the Guide for Development are followed. The detention basins will be designed to be aesthetically pleasing and to function for a variety of recreational needs (EIP, 2000). The basins measure approximately 2.5 acres each at the surface and have a maximum depth of six feet for total storm water storage of 15.5 acre-feet. Another optional site for a pond is the eastside of the property immediately north of the creek. A large oak tree is located in the area and should be considered if this site is selected. Increased depths could be considered provided standards in the Guide for Development are followed. The capacity of each basin is as shown in **Table 4.7-1** below:

Table 4.7-1
Detention Basin Configuration/Capacity

	Site Detention Basin (For storage of flows originating within study area.)	**Off-Stream Storage Basin (For storage of flows originating upstream of study area.)**
Basin Capacity	7.5 ac-ft	8 ac-ft

Based on the proposed configuration of both a site detention facility and off-stream storage facility, the impact to flow to the Arcade Creek and water surface elevations were evaluated using the HEC-1 and HEC-RAS computer models, respectively. A comparison of computer modeling results between pre-development conditions and post-development conditions that include the proposed detention basins are shown for the 100-year frequency storm in **Tables 4.7-2** and **4.7-3** respectively.

Table 4.7-2
Summary of 100-year Flows

Location	Pre-Development 100-year Flow (cfs)	Post-Development with Detention Facilities 100-year Flow (cfs)	Difference Pre to Post with Detention (cfs)
Crosswoods	2,267	2,228	-39
Cripple Creek	3,770	3,736	-34
Greenback Lane	3,682	3,633	-49
Garfield/Madison	4,502	4,365	-137
Winding Way	4,890	4,741	-149
College Oak Drive	4,974	4,885	-89
Interstate 80	5,246	5,186	-60
Norwood	5,581	5,501	-79

Source: Morton & Pitalo, 2000.

Table 4.7-3 illustrates that the proposed development of Stock Ranch and configuration of detention facilities will not increase the 100-year water surface elevations in Arcade Creek.

Based on subsequent HEC-1 and HEC RAS Hydrologic and hydraulic evaluations, it was also determined that the proposed detention facilities will serve to slightly decrease the water surface elevations downstream of the proposed development for the 10-year, 25-year, and 50-year frequency storms as shown in **Table 4.7-4**.

Table 4.7-3
Summary of 100-year Water Surface Elevations (WSE)

Location	Pre-Development 100-year Flow (cfs)	Post-Development with Detention Facilities 100-year Flow (cfs)	Difference Pre to Post with Detention (cfs)
Crosswoods	124.86	124.78	-0.08
Cripple Creek	111.12	111.04	-0.08
Greenback Lane	107.62	107.56	-0.06
Garfield/Madison	89.30	89.09	-0.21
Winding Way	79.69	79.53	-0.16
College Oak Drive	78.26	78.13	-0.13
Interstate 80	64.07	64.00	-0.07
Norwood	36.49	36.48	-0.01

Source: Morton & Pitalo, 2000

Table 4.7-4
Summary of Changes to Water Surface Elevations (WSE)
Based on the Proposed Drainage Mitigation

Location	10-Year	25-Year	50-Year	100-Year
Crosswoods	-0.11	-0.18	-0.14	-0.08
Cripple Creek	-0.08	-0.13	-0.14	-0.08
Greenback Ln.	-0.07	-0.09	-0.09	-0.06
Garfield	-0.14	-0.07	-0.25	-0.21
Winding Way	-0.10	-0.10	-0.01	-0.16
College Oak Dr.	-0.09	-0.09	-0.09	-0.13
Interstate 80	-0.06	-0.06	-0.04	-0.07
Norwood	0.00	-0.01	-0.01	-0.01

Source: Morton & Pitalo, 2000.

With the inclusion of the two (2) proposed basins for detention and storage, the project would implement the specifications of the Guide and thereby mitigate impacts of increased runoff and flooding. As a result, impacts on the Creek watershed as a whole are considered **less than significant**. Further, the project's inclusion of the detention basins supports and is consistent with *the City of Citrus Heights Draft General Plan* **Policy 48.1** - Promote drainage improvements that minimize flooding.

Erosion

Impact 4.7-2: Development of the project site would entail earthwork and grading. Due to the surface soil characteristics (slight to moderate erosion potential) the project site may be subject to erosion during project construction. Project-related alterations in on-site drainage patterns during construction could initiate and increase on-site erosion. This represents a potentially significant impact. *Note: This impact can be mitigated to an acceptable level. See discussion below.*

Erosion is probable on the project site during construction and as associated with the site drainage system. Soil erosion can cause numerous types of environmental impacts, which could impact the water quality of Arcade Creek and San Juan Creek. Soils can contain nitrogen and phosphorus, which when carried into water bodies can trigger algal blooms. Extensive blooms of algae can reduce water clarity, deplete oxygen concentrations, and create unpleasant odors. Excessive deposition of sediments in stream channels can blanket animals and clog streambeds, degrading aquatic habitat. Increased turbidity due to suspended sediments may also reduce photosynthesis that produces food supply and aquatic habitat. Finally, sediment from project-induced onsite erosion could accumulate in the downstream drainage facilities, which could interfere with flow, aggravating downstream flooding conditions. These impacts associated with erosion and sedimentation are **potentially significant**. *However, as noted below, several feasible options are available to reduce this impact to a less than significant level.*

Mitigation Measures

MM 4.7-2: Implementation of the following mitigation measures would reduce construction-related erosion and sedimentation impacts to **less-than-significant** levels:

1) The project shall comply with all Phase I NPDES Storm Water regulations for major project construction activities. In particular, the project-grading plan shall include Drainage and Erosion Control Plans to minimize the impacts from erosion and sedimentation during grading. This plan shall conform to all standards adopted by the City of Citrus Heights. This plan shall include at least the following procedures: (a) restricting grading to the dry season; (b) protecting all finished graded slopes from erosion using such techniques as erosion control matting and hydro-seeding; (c) protecting downstream storm drainage inlets from sedimentation; (d) use of silt fencing and hay bales to retain sediment on the project site; (e) use of temporary water conveyance and water diversion structures to eliminate runoff onto the banks of the Creeks; and (f) any other suitable measures outlined by the City Engineer.

Responsibility for Implementation:	Applicant
Responsibility for Monitoring:	City of Citrus Heights
Timing:	The applicant shall provide a detailed drainage plan to the City of Citrus Heights demonstrating compliance with this requirement prior to the issuance of any building permits. Monitoring for compliance with the plan shall occur during the construction phase of the project as part of the City's standard inspections associated with grading and building permits.

With implementation of the mitigation measures set forth above, the impacts associated with erosion would be **less-than-significant.**

Water Quality

Impact 4.7-3: The proposed project would increase the amount of non-point source and point source pollutants generated at the site during storm events, impacting the water quality of Arcade Creek, and causing a cumulative water quality impact to the City system. This is a potentially significant impact. *Note: This impact can be mitigated to an acceptable level. See discussion below.*

Development of the site could result in increased non-point source and point-source contamination from common urban sources, construction activity and vehicle use. Changes to the land use of the site, including an increase of impervious surfaces, and an increase in the

amount of vehicular traffic through the site, would increase the amount of non-point source pollutants generated at the project site.

Runoff from residential, commercial and institutional urban uses typically includes sediment, herbicides, pesticides, nutrients from fertilizers, organic debris, coloform, trash, grease, solvents, metals, salts and other contaminants. Runoff from streets and parking lots contains typical urban pollutants including oil, grease, fuel, rubber, heavy metals, solvents, coloform, and trash. Motor vehicle exhausts will generate lead and particulates that could be picked up by runoff and carried into nearby surface water bodies. If unmitigated, these pollutants could enter both Arcade Creek and San Juan Creek and ultimately the Sacramento River. Mitigation Measure

Implementation of the following mitigation measure would further reduce the water quality-related pollution impacts associated with development of the site:

MM 4.7-3: 1) Pursuant to NPDES requirements, the applicant shall develop a stormwater pollution prevention plan (SWPPP) for the project site. At a minimum, the SWPPP shall: (a) identify specific types and sources of stormwater pollutants; (b) determine the location and nature of potential impacts; and (c) specify appropriate control measures to eliminate any potentially significant impacts to receiving water quality from stormwater runoff. Control measures should include use of grassed swales or vegetated buffer strips, street sweeping of the entrance driveway during the summer months when traffic is greatest, and other design or source control management practices, as appropriate, to mitigate potential water quality effects.

2) On-site detention facilities and/or a catch basin filtration system designed to adsorb oil and grease, petroleum hydrocarbons and heavy metals shall be installed to settle and capture pollutants to an acceptable degree before they are carried into the Creek system. The design for these facilities and/or systems shall be reviewed and approved by the City of Citrus Heights Public Works Department to comply with the requirements of the City's NPDES Permit. The applicant shall be required to implement a regular maintenance schedule for such facilities, subject to City review and inspection, or the applicant shall hire a service to carry out such maintenance. Maintenance shall include periodic removal of accumulated sediments and/or flushing of systems

Responsibility for Implementation:	Applicant
Responsibility for Monitoring:	City of Citrus Heights
Timing:	1: One-time Action) The applicant shall provide a detailed water quality control plan to the City of Citrus Heights demonstrating compliance with this requirement prior to the issuance of any building permits. 2: Ongoing Action). The applicant shall provide for long-term

maintenance of facilities and systems comprising the water quality control plan.

With implementation of the mitigation measures set forth above, the impacts on hydrology and water quality, would be **less-than-significant.**

4.7.6 CUMULATIVE IMPACTS

The proposed project would incrementally increase the amount of impervious surfaces within the City. However, because the majority of the City is already developed and the fact that development would be required to comply with the General Plan goals/policies, as well as the NPDES requirements, the project is considered to be cumulatively **less than significant**.

Development of the project would increase the amount of non-point-source contamination (e.g. construction, vehicles, etc.). Runoff form residential and commercial uses typically include sediment, herbicides, pesticides, nutrients from fertilizers, organic debris, coloform, trash, grease, solvents, metals, slats and other contaminants. Runoff from streets and parking lots contains typical urban pollutants including oil, grease, fuel, rubber, heavy metals, solvents, coloform and trash. Motor vehicles exhaust also generates lead and particulates that could be picked up by runoff and carried into nearby surface water bodies such as Arcade Creek. This impact can be mitigated to **less than significant** levels by implementing the project-specific mitigation measures: develop a stormwater pollution prevention plan (SWPPP) for the project site; install on-site detention facilities and/or a catch basin filtration system designed to adsorb oil and grease, petroleum hydrocarbons and heavy metals to settle and capture pollutants to an acceptable degree before they are carried into the Creek system.

REFERENCES

City of Citrus Heights: *General Plan – Summary of Background Information* (April 1999)

City of Citrus Heights: *Draft Environmental Impact Report for the General Plan* (August 2000)

EIP. *Stock Ranch Draft Guide for Development* (August 30, 2000)

Morton & Pitalo, Inc: *Drainage Impact Analysis for Stock Ranch Development* (2000)

Stantec Consulting Inc: *Peer Review Technical Memorandum* (September 2000)

MHM: *Detention Facility Analysis at Stock Ranch for City of Citrus Heights* (September 2000)