



**Hansen and Associates, Inc.**  
Consulting Engineers & Land Surveyors

**JDC RANCH**  
Weber County

**STORM DRAINAGE FEASIBILITY REPORT**



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# JDC Ranch

## Storm Drainage Feasibility Report

### Introduction

The JDC property (shown in purple in the accompanying exhibit) is located in the unincorporated territory of Weber County between Plain City and Farr West City, bordering and on the north side of 2600 North Street. The 236-acre project is proposed to consist of mixed residential (single family to multi-family) units with commercial elements bordering 2600 North. Farr West City borders the site on the east and Plain City on the west. This report focuses on storm drainage feasibility matters.

The vacant site has a very flat topography and consists of open range land. In general, elevations are as follows along the site boundaries:

East: 4241

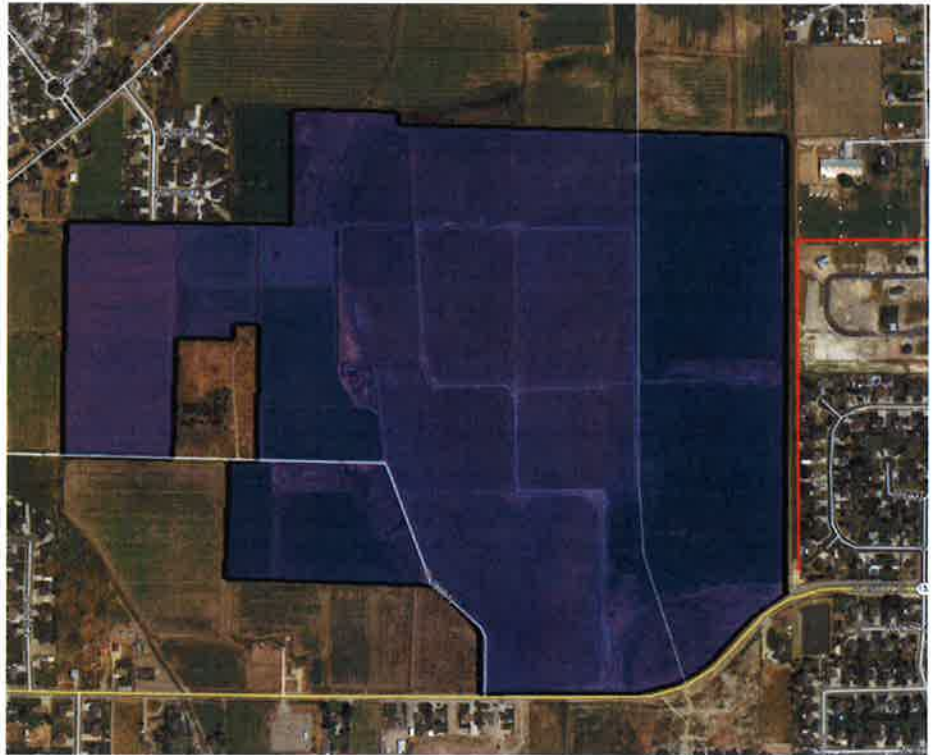
South: 4242

West: 4244

North: 4240

### Current Storm Drainage Facilities

The ranch property has an existing and effective tile drain system - measurements by a geotechnical firm in May, 2020 revealed groundwater depths at 5 to 5-1/2 feet. This plays a central role in the type of drainage system and is discussed further in this report. There is an existing, significant drainage/irrigation channel that runs near/along the east JDC Ranch boundary. The drainage channel flows from south-to-north to 3300 North Street, and then traverses westward. There are sections in this northerly area (north of JDC Ranch) that are piped with 36-inch to 48-inch piping. The channel typically (visually) has approximately five feet of open storage. In unique high storm event time periods, it has flowed close to its banks.



### Jurisdiction

The JDC Ranch proposal is advanced as being a project developed in the County. As such, it is unlikely for storm flows to be favorably received routing through adjoining municipality storm drainage systems. There are some practical challenges with such an approach, even if municipal drainage systems were available in the area - these are discussed below.

### **Drainage Challenges**

The piping distances and groundwater depths compel the JDC Ranch drainage system to be developed as a series of interspersed retention areas. This is actually philosophically in harmony with the newly enacted state Low Impact Development policies. The ranch is approximately 4200 feet across in the east-west direction. Piping at a 0.5% slope would entail a drop of 21 feet! Common design typically has underground storm piping commencing at the upstream end at a depth of three feet. With groundwater at 5 to 5-1/2 feet, it is assumed that bottom pond elevations can't be deeper than five feet. Installing piping at a 0.5% grade affords only 400 feet of storm piping that would result in a two-foot fall (underground piping dropping from three feet deep to five feet deep). Piping long distances would result in encroachments into the groundwater strata. Thus, storm drainage storage systems need to be quite localized.

### **Proposed Drainage System**

It is advanced that the JDC Ranch employ a system of multiple retention ponds integrated into each development pod, probably in conjunction with landscaping improvements. Sometimes it's effective to surface drain to curb cut locations that discharge to shallow, attractive two-foot deep drainage depression areas, rather than utilize storm piping which of necessity mandates deeper ponds.