1982

Flood Insurance Study, City of North Ogden, Utah, Weber County

Federal Emergency Management Agency

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FLOOD INSURANCE STUDY

CITY OF NORTH OGDEN, UTAH
WEBER COUNTY

JULY 19, 1982

Federal Emergency Management Agency
COMMUNITY NUMBER-490214
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Exhibit 1 - Flood Profiles

North Ogden Tributary                                           Panels 01P-04P
Coldwater Gulch                                                  Panels 05P-10P

Exhibit 2 - Flood Boundary and Floodway Map Index
Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map
1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the City of North Ogden, Weber County, Utah, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert North Ogden to the regular program of flood insurance by the Federal Emergency Management Agency. Local and regional planners will use this study in their efforts to promote sound floodplain management.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these federally supported studies are based. These criteria take precedence over the minimum Federal criteria for purposes of regulating development in the floodplain, as set forth in the Code of Federal Regulations at 24 CFR, 1910.1(d). In such cases, however, it shall be understood that the State (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgments

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were performed by Gingery Associates, Inc., for the Federal Emergency Management Agency, under Contract No. H-4790. This work, which was completed in December 1980, covered all significant flooding sources affecting North Ogden.

1.3 Coordination

Streams requiring detailed and approximate study were identified at an initial coordination meeting attended by representatives of the study contractor, the Federal Emergency Management Agency, and the City of North Ogden on April 24, 1978.

Results of the hydrologic analyses were coordinated with the U.S. Army Corps of Engineers, Sacramento District; the Utah Division of Water Resources; the U.S. Geological Survey; the Davis County Planning Commission; and other agencies involved.

The final community coordination meeting was held on August 11, 1981, and was attended by representatives of the Federal Emergency Management Agency, the study contractor, and the city. No problems were raised at the meeting.
2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated areas of the City of North Ogden, Weber County, Utah. The area of study is shown on the Vicinity Map (Figure 1). Areas of unincorporated Weber County land within the corporate limits of North Ogden were not included in this study. Cache National Forest territory in the city was not studied.

Flooding caused by the overflow of North Ogden Tributary, Barrett Gulch, Spring Gulch, and Coldwater Gulch was studied in detail. The lengths of these study segments are 0.8 mile, 2.2 miles, 1.7 miles, and 2.7 miles, respectively.

Those areas studied by detailed methods were chosen with consideration given to all proposed construction and forecasted development through 1985.

2.2 Community Description

The City of North Ogden is in north-central Weber County, in north-central Utah. It is bordered by the Cities of Pleasant View to the west, Harrisville to the southwest, and Ogden to the south; unincorporated Weber County land lies to the east and north.

The population of North Ogden was estimated at 7364 in 1975 and is projected to be 16,310 in 1995 (Reference 1).

The city occupies an area of approximately 4670 acres. Limited flood plain development exists on all of the detailed study streams in North Ogden.

North Ogden has a temperate, semiarid climate with four well-defined seasons; summers are warm and dry and winters are cold, but usually not severe. The average temperature in North Ogden is 51.4°F, and average annual precipitation totals 20 inches (Reference 2).

The changes in topography in the area are often dramatic, with the high mountain peaks dropping to low terraces and lake plains. Flow in the area generally begins in the mountain basins and flows westerly in steep canyons cut through the front range of peaks toward the urbanizing lake plain. The native vegetation consists mainly of grasses (salt grass and wire grass) at the low terraces, changing to small bushes and shrubs (sagebrush and brushy oak) at the higher terraces and up to an elevation of approximately 7500 feet. Above that elevation, alpine forest of aspen, fir, pine, and spruce is predominant.

All four streams in the study area flow southwesterly through North Ogden. North Ogden Tributary flows at an average slope-
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of 473 feet per mile. It has a drainage area of 1.0 square mile at Alberta Drive. Barrett Gulch flows at an average slope of 600 feet per mile. At the canyon mouth, it drains an area of 0.6 square mile, and at the downstream limit of study, it drains a total area of 1.4 square mile. Spring Gulch flows at an average slope of 306 feet per mile and drains an area of 1.9 square miles at the canyon mouth. Coldwater Gulch flows at an average slope of 175 feet per mile. At the canyon mouth, it drains an area of 2.2 square miles and has a total drainage area at the downstream limit of study (Union Pacific Railroad) of 3.6 square miles.

The primary underlying soils at North Ogden are of the Kilburn Association. They are well drained to somewhat excessively drained (Reference 3).

2.3 Principal Flood Problems

Flooding on the streams in North Ogden would most likely result from cloudburst storms centered over the drainage basins. Such storms, which may last anywhere from several minutes to a few hours, characteristically produce mass-debris flow, which is a viscous mixture of floodwater, soil, rocks, washed-out trees, brush, and other flood debris. Cloudburst storms in this area characteristically occur between May 15 and September 15. Flooding from snowmelt does not constitute as serious a flood hazard as that associated with thunderstorms. This is because snowmelt floods do not have the high peak flows or high velocities that are characteristic of cloudburst storm flooding.

North Ogden has experienced some flooding in the past, but little definitive data on specific floods are available. Historical data are limited to newspaper accounts. Flooding was reported on August 11, 1930; August 8, 1941; and July 13, 1965. Usually, most of the flooding occurred over farmlands, close to the canyon mouths, leaving the land damaged from the deposition of sand, silt, and debris.

2.4 Flood Protection Measures

There are no flood protection measures, existing or proposed, for the City of North Ogden, and no flood plain management is in effect.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equalled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected.
having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equalled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual occurrence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported here reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail affecting the community.

The detailed hydrologic analysis for the streams covered in this study is included in a hydrology report prepared in October 1979 (Reference 4). The key features of the hydrologic approach are summarized here.

For any particular stream, the discharge-frequency relationships were developed for both the snowmelt-caused floods and the rainfall-caused floods. These two distributions were statistically combined to give a discharge-frequency curve for the combined snowmelt-rainfall event.

The runoff records of sixteen gaging stations located within the general vicinity of the study area, with lengths of record ranging from 8 to 45 years, were searched for the yearly peak flows caused by snowmelt and the yearly peak flows caused by rainfall. Using the U.S. Water Resources Council Bulletin 17A (Reference 5) approach for each gaging station location, the 10-, 50-, 100-, and 500-year frequency discharges were developed separately for the snowmelt and rainfall events.

Using the stepwise regression approach, eight regression equations were developed for all four frequencies and the two kinds of flood events. Only drainage area was found to be the key independent variable in the regression equations.

The regression equations representing the snowmelt flood events resulted in a good correlation coefficient, but the regression equations for the rainfall-caused floods provided poor correlation
and were unacceptable. It was found necessary to use a watershed model to simulate rainfall-caused floods.

The Storm Water Management Model (SWMM) developed by the U.S. Environmental Protection Agency was used to simulate rainfall-caused floods (Reference 6). A total of 16 streams were simulated by the SWMM to yield discharge hydrographs for 10-, 50-, and 100-year frequency storms.

Using the stepwise regression approach, the regression equations were developed to predict the 10-, 50-, and 100-year frequency discharges at the canyon mouth and at the location downstream of the developed area. The 500-year frequency discharge is obtained by extrapolation of the 10-, 50-, and 100-year frequency discharges.

In the final evaluation, the discharge-frequency distribution curve due to snowmelt for a stream was determined from analysis of the gaging station records or the related regression equations. The discharge-frequency distribution curve for the rainfall events was evaluated from the results of the SWMM simulation or the related regression equations. These two independent events were statistically combined to yield a discharge-frequency distribution for the combined event.

Peak discharge-drainage area relationships for North Ogden Tributary and Coldwater, Spring, and Barrett Gulches are shown in Table 1.

Discharges on Coldwater Gulch reflect the storage effect of embankments crossing the flood plain.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the flooding sources studied in the community were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of these flooding sources.

Water-surface elevations of floods of the selected recurrence intervals were computed using the U.S. Army Corps of Engineers HEC-2 step-backwater computer program (Reference 7).

Cross section data for streams in North Ogden were obtained from topographic maps at a scale of 1:2400, with a contour interval of 2 feet (Reference 8). The aerial photography for these maps was flown on December 13 and 14, 1978.

All bridges, dams, and culverts were measured to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments
Table 1. Summary of Discharges

<table>
<thead>
<tr>
<th>Flooding Source and Location</th>
<th>Drainage Area (Square Miles)</th>
<th>Peak Discharges (Cubic Feet per Second)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Ogden Tributary At Elberta Drive</td>
<td>1.0</td>
<td>20  60  95  230</td>
</tr>
<tr>
<td>Coldwater Gulch At Union Pacific Railroad At Canyon Mouth</td>
<td>3.6  2.2</td>
<td>50  35  75  55  80  85</td>
</tr>
<tr>
<td>Spring Gulch At Canyon Mouth</td>
<td>1.9</td>
<td>30  50  70  150</td>
</tr>
<tr>
<td>Barrett Gulch At Elberta Drive</td>
<td>1.4</td>
<td>20  75  115 300</td>
</tr>
<tr>
<td></td>
<td>At Canyon Mouth</td>
<td>0.6  10  15  20  36</td>
</tr>
</tbody>
</table>
for which a floodway is computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

Roughness coefficients (Manning's "n") for North Ogden Tributary and Coldwater Gulch used in the hydraulic computations were estimated by field inspections at each cross section. The channel and overbank roughness values are shown in the following list:

<table>
<thead>
<tr>
<th>Stream</th>
<th>Roughness Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Ogden Tributary</td>
<td>0.045</td>
</tr>
<tr>
<td>Coldwater Gulch</td>
<td>0.035 - 0.040</td>
</tr>
<tr>
<td></td>
<td>0.050 - 0.060</td>
</tr>
</tbody>
</table>

Starting water-surface elevations for Coldwater Gulch were obtained from a rating curve derived by the study contractor for the culvert under the Union Pacific Railroad. Starting water-surface elevations for North Ogden Tributary were determined using the slope-area method.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

Shallow flooding for Barrett Gulch, Spring Gulch, and part of North Ogden Tributary was analyzed using field inspection, normal-depth calculations, and engineering judgment. Flooding in these areas was determined to be generally less than 1 foot. A retention pond is situated along Barrett Gulch where floodwaters will pond to a depth greater than 1 foot.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are, thus, considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in the study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages State and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study includes a flood boundary map designed to assist communities in developing sound flood plain management measures.
4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the Federal Emergency Management Agency as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100- and 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:2400, with a contour interval of 2 feet (Reference 8).

Boundaries for shallow flooding areas were delineated using the previously determined depths and elevations, and maps at a scale of 1:2400, with a contour interval of 2 feet (Reference 8).

Approximate flood boundaries in some portions of the study area were taken from the Flood Hazard Boundary Map (Reference 9).

Flood boundaries for the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 2). In cases where the 100- and 500-year flood boundaries are close together, only the 100-year flood boundary has been shown. Small areas within the flood boundaries may lie above the flood elevations and, therefore, not be subject to flooding; owing to limitations of the map scale, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights. Minimum standards of the Federal Emergency Management Agency limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this report are presented to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.
The floodways presented in this study were computed on the basis of equal-conveyance reduction from each side of the flood plain. The results of these computations were tabulated at selected cross sections for each stream segment for which a floodway was computed (Table 2).

Due to the shallow nature of the flooding for Barrett Gulch, Spring Gulch, and part of North Ogden Tributary, the concept of a floodway is not applicable for these flooding sources; therefore, no floodway was computed.

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway widths were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

![Figure 2. Floodway Schematic](image-url)
<table>
<thead>
<tr>
<th>CROSS SECTION</th>
<th>DISTANCE</th>
<th>WIDTH (FEET)</th>
<th>SECTION AREA (SQUARE FEET)</th>
<th>MEAN VELOCITY (FEET PER SECOND)</th>
<th>REGULATORY BASE FLOOD WATER SURFACE ELEVATION</th>
<th>WITHOUT FLOODWAY</th>
<th>WITH FLOODWAY</th>
<th>INCREASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Ogden Tributary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
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<td>0.1</td>
<td>4,544.1</td>
<td>4,544.1</td>
<td>4,545.1</td>
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<td>29</td>
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<td>4,545.3</td>
<td>4,545.3</td>
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<td>1,300</td>
<td>7</td>
<td>12</td>
<td>7.8</td>
<td>4,634.2</td>
<td>4,634.2</td>
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<td>10</td>
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<td>4,715.4</td>
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<td>4,863.9</td>
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<td>6.7</td>
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<td>4,908.4</td>
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<td>4,908.4</td>
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</table>

1 Feet From 3100 North Street
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<thead>
<tr>
<th>CROSS SECTION</th>
<th>DISTANCE (FEET)</th>
<th>WIDTH (FEET)</th>
<th>SECTION AREA (SQUARE FEET)</th>
<th>MEAN VELOCITY (FEET PER SECOND)</th>
<th>REGULATORY WITHOUT FLOODWAY (FEET)</th>
<th>WITH FLOODWAY (FEET NGVD)</th>
<th>INCREASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coldwater Gulch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>9,050</td>
<td>25/13²</td>
<td>29</td>
<td>5.3</td>
<td>4,330.7</td>
<td>4,330.7</td>
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</tr>
<tr>
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<td>25/12</td>
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<td>4,337.0</td>
<td>0.2</td>
</tr>
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<td>9,755</td>
<td>40/20²</td>
<td>33</td>
<td>5.2</td>
<td>4,339.6</td>
<td>4,339.6</td>
<td>0.2</td>
</tr>
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<td>9,625</td>
<td>40/20²</td>
<td>115</td>
<td>1.6</td>
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</tr>
<tr>
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<td>12</td>
<td>7.2</td>
<td>4,710.6</td>
<td>4,710.6</td>
<td>0.0</td>
</tr>
</tbody>
</table>

1 Feet Above Union Pacific Railroad  
²Width/Width Within Corporate Limits
5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the Federal Emergency Management Agency has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHPs), and flood insurance zone designations for each flooding source studied in detail affecting the City of North Ogden.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach:

<table>
<thead>
<tr>
<th>Average Difference Between 10- and 100-Year Floods</th>
<th>Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2 feet</td>
<td>0.5 foot</td>
</tr>
<tr>
<td>2 to 7 feet</td>
<td>1.0 foot</td>
</tr>
<tr>
<td>7.1 to 12 feet</td>
<td>2.0 foot</td>
</tr>
<tr>
<td>More than 12 feet</td>
<td>3.0 foot</td>
</tr>
</tbody>
</table>

The locations of the reaches determined for the flooding sources of North Ogden are shown on the Flood Profiles (Exhibit 1) and summarized in Table 3.

5.2 Flood Hazard Factors

The FHF is the Federal Emergency Management Agency device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHF are used to set actuarial insurance premium rate tables based on FHPs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest one-half foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHPs, the entire incorporated area of North Ogden was divided into zones,
<table>
<thead>
<tr>
<th>FLOODING SOURCE</th>
<th>PANEL 1</th>
<th>ELEVATION DIFFERENCE² BETWEEN 1% (100-YEAR) FLOOD AND</th>
<th>FLOOD HAZARD FACTOR</th>
<th>ZONE</th>
<th>BASE FLOOD ELEVATION (FEET NGVD)³</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Ogden Tributary</td>
<td></td>
<td>10% (10-YEAR) 2% (50-YEAR) 0.2% (500-YEAR)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1</td>
<td>0001</td>
<td>-4.3 -2.4 1.5</td>
<td>045</td>
<td>A9</td>
<td>Varies - See Map</td>
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<td>Reach 2</td>
<td>0001</td>
<td>-0.8 -0.3 0.8</td>
<td></td>
<td>A2</td>
<td>Varies - See Map</td>
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<tr>
<td>Coldwater Gulch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1</td>
<td>0002</td>
<td>-0.9 -0.3 0.6</td>
<td>010</td>
<td>A2</td>
<td>Varies - See Map</td>
</tr>
<tr>
<td>Barrett Gulch Ponding</td>
<td>0001</td>
<td>N/A N/A N/A</td>
<td>N/A</td>
<td>AH</td>
<td>4760</td>
</tr>
</tbody>
</table>

¹ Flood Insurance Rate Map Panel ² Weighted Average ³ Rounded to Nearest Foot

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOOD INSURANCE ZONE DATA

CITY OF NORTH OGDEN, UT (WEBER CO.)

NORTH OGDEN TRIBUTARY-COLDWATER GULCH-BARRETT GULCH
each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

**Zone A:**
Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.

**Zones A2 and A9:**
Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FHFs.

**Zone AH:**
Special Flood Hazard Areas inundated by types of 100-year shallow flooding where depths are between 1.0 and 3.0 feet; base flood elevations are shown, but no FHFs are determined.

**Zone B:**
Areas between the Special Flood Hazard Areas and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; also areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

**Zone C:**
Areas of minimal flooding.

**Zone D:**
Areas of undetermined, but possible flood hazards.

The flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community are summarized in Table 3.

### 5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for North Ogden is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the Federal Emergency Management Agency.
6.0 OTHER STUDIES

Flood Insurance studies are being prepared for the adjacent communities of Ogden, Harrisville, and Pleasant View, and for the unincorporated areas of Weber County (References 10, 11, 12, and 13). The results of those studies are consistent with the results of this study.

A Flood Hazard Boundary Map was published for the City of North Ogden in May 1977 (Reference 9); portions of that map have been used in this study.

This study is authoritative for the purposes of the National Flood Insurance Program; data presented herein either supersede or are compatible with all previous determinations.

7.0 LOCATION OF DATA

Information concerning the pertinent data used in this study can be obtained by contacting the Natural and Technological Hazards Division, Federal Emergency Management Agency, Building 710, Denver Federal Center, Lakewood, Colorado 80225.

8.0 BIBLIOGRAPHY AND REFERENCES


