

Intersection of Civil Engineering and Appraisals
NCAREA Presentation
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A number of water-related civil engineering considerations can influence potential uses and values of property. The purpose of this presentation is to alert the appraisal community to some of the commonly encountered water-related issues that may influence property valuation.

7:00 – 7:10

I. Introduction

7:10-8:00

II. Colorado Water Rights; Appropriation Doctrine

A. Introduction

1. Survey of Fundamentals

B. Historical Development

1. Climate of the West
2. Fair, flexible, practical and reliable

C. Appropriation Doctrine and Economic Development

D. Groundwater

1. Permit system
2. Tributary groundwater
3. Nontributary aquifers
4. The 100-year rule

E. Elements of the Appropriation Doctrine

1. Two major concepts
 - a. Acquired by appropriation
 - b. Chronological order: first in time, first in right
2. Usufructuary
 - a. Vested real property right
 - b. Actual ownership is with the public
3. Beneficial use
 - a. To encourage economic development
 - b. Take only what is needed
 - c. No waste allowed

F. Permits

1. Groundwater permits
2. State Engineer's Office
3. Various types of permits

G. Determination of Rights

1. Water Court process

- 2. Quantification
 - a. Volume (diversion vs. consumption)
 - b. Seniority/reliability
- H. Regulation and Administration
 - 1. Water Divisions
 - 2. Water Districts
 - 3. Water Commission
 - 4. Regulates diversions
 - 5. Regulates storage
- I. Changed Conditions of Use (Flexibility)
 - 1. Change of use
 - 2. Change in time of diversion
 - 3. Change of place of use
 - 4. Process in Water Court
 - 5. Common measure of water right value
 - a. Common denominator utilized
 - b. How to define historic consumptive use
 - 6. Noninjury to others
 - a. Maintain return flow
 - 7. What is burden on stream
- J. Loss of Water Rights
 - 1. Use it or lose it
 - 2. Abandonment list
 - 3. Nurturing of water rights
- K Types of Ownership
 - 1. Private
 - 2. Mutual
 - 3. Common carriers
 - 4. Reclamation
 - a. Colorado Big Thompson Units
- L. Hydrofracturing Water Demands
 - 1. Oil and gas activity
 - 2. Hydrofracturing and number of rigs
 - 3. Water needs per well

8:00-8:10 Break

8:10-8:20

- III. Wetlands and Other Waters of the U.S.
 - A. Clean Water Act, 92–500.
 - B. Section 404 of the Clean Water Act restricts/regulates most activities that impact wetlands and other waters of the U.S.
 - C. Wetlands and other waters of the U.S. can include marshes, wet meadows, forested riparian areas, ditches, creeks, rivers, ponds, lakes, arroyos and other hydrologic features.

- D. The current definition of the extent and scope of waters of the U.S. is provided in several Supreme Court decisions (Rapanos v. U.S. and Solid Waste Agency of Northern Cook County v. U.S.)
- E. The U.S. Army Corps of Engineers and U.S. Environmental Protection Agency have joint authorization to administer Section 404, including jurisdictional determinations for hydrologic features and issuing permits.
- F. Potential permittees can expect a process of jurisdictional determinations and permitting. Highlights are:
 - 1. Jurisdictional vs. nonjurisdictional hydrology features
 - a. Delineation process
 - b. Approved vs. preliminary jurisdictional determination
 - c. Timing
 - 2. Permitting
 - a. Individual Permits (requirements and timing)
 - b. Nationwide Permits (examples, requirements, timing)
 - c. Mitigation (onsite vs. offsite)
- G. Some local governments (Cities of Boulder and Silverthorne, Rio Blanco County, etc.) have additional wetland regulations that go beyond the federal requirements. Many of these establish protective buffers around wetlands and other water bodies that can further restrict land use.
- H. Case examples:
 - 1. Lincoln, NE (jurisdictional determinations)
 - 2. Sanderson Gulch (jurisdictional determinations, permitting)
 - 3. South Shore (permitting, mitigation)

8:20-8:30

IV. Floodplains

- A. Tools to determine where property is in relation to a regulatory floodplain or floodway
 - 2. Most communities have a FEMA Flood Insurance Rate Map, or FIRM, which shows the FEMA-approved 100-year floodplain and regulatory floodway
 - 3. The 100-year floodplain is the area of land inundated by the 100-year flood
 - 3. The floodway is the area of land along a channel where fill and development would be likely to divert flow and increase flood depths; it must be left unobstructed in order to carry the 100-year flood without unacceptable rises in flood elevations
 - 4. Flood fringe is the area of land between the floodway and the 100-year floodplain.
- B. You can build on the flood fringe as long as you don't cause unacceptable rises in 100-year flood elevations
- C. You cannot build in a floodway
- D. In order to procure a loan for property within the 100-year floodplain, you have to buy flood insurance
- E. What is flood insurance?

- F. FEMA FIRMs show several different zones
 - 1. AE zones are flood delineations based on detailed studies.
 - a. Flood elevations are established. If you want to build in an AE zone, typically you must build such that the first floor elevation (FFE) is at least one foot above the flood elevation
 - 2. A zones are flood delineations based on approximate methods.
 - a. Pay attention to property in proximity of A zones. If a detailed study is performed, property that was outside the 100-year floodplain could be mapped within
 - b. Conversely, a property currently within an approximate 100-year floodplain (zone A) may not be in the 100-year floodplain once a detailed study is performed
- G. Many communities enforce regulations that are stricter and more confining when developing within a FEMA regulatory floodplain versus outside a FEMA regulatory floodplain

8:30-8:40

- V. Drainage at Residential Development
 - B. The Urban Drainage and Flood Control District (UDFCD) was created in 1967 via state legislation
 - 1. Boundary
 - 2. Counties included
 - B. Drainage Criteria Manual
 - C. Significance of drainage criteria on development
 - D. Residential drainage criteria
 - 1. International Code Council (formerly Uniform Building Code) requirements
 - 2. Slope away from building foundation
 - 3. Ground to top of foundation clearance
 - 4. Deficiency consequences

8:40-8:50

- VI. Expansive Soils That Cause Foundation Heave
 - A. Problem soil prevalence along Front Range
 - B. What is expansive soil?
 - C. The enemy is water and our friend is good drainage
 - D. Expansive soil effect on foundations and concrete slabs
 - E. Homebuilder efforts to avoid effects of heaving soils

8:50-9:00 Discussion and Questions