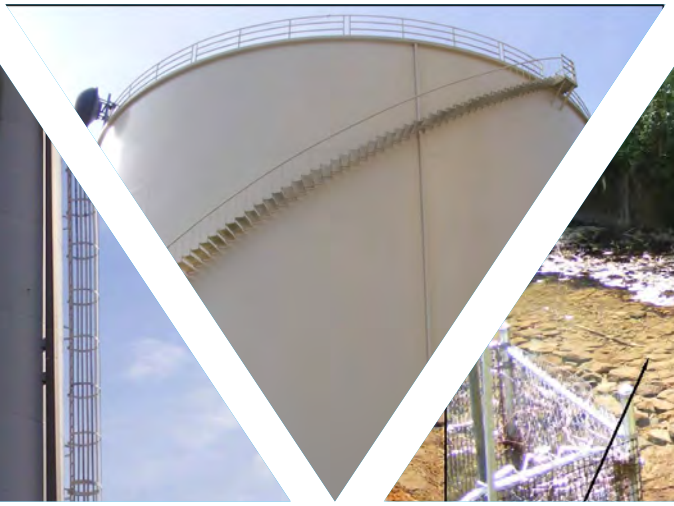
City of Camas
WASHINGTON

# Water System Plan Update

*Appendices*



## FINAL
## October 2019

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# City of Camas
# Water System Plan Update

*Appendices*

**FINAL • October 2019**

# APPENDIX A – ADOPTING RESOLUTION

*To be completed at a later date.*

# APPENDIX B – SEPA, AGENCY COMMENTS

Community Development Department
616 NE Fourth Avenue
Camas, WA 98607
(360) 817-1568
www.cityofcamas.us

September 4, 2019

Sam Adams
Utility Manager
1620 SE 8th Avenue
Camas, WA 98607

Dear Sam Adams,

The SEPA Determination of Non-Significance for the Camas General Water System Plan (SEPA19-10) was issued June 6, 2019. The two week comment period ended June 20, 2019 at 5:00 p.m. One comment was received from Clark County stating the proposed development is not anticipated to impact the County's regionally significant intersections and corridors. The decision is final.

Sincerely,

Madeline Sutherland,
Assistant Planner

Date Published: June 6, 2019

To Whom It May Concern:

Please find enclosed a Determination of Non-Significance (DNS) for the **Camas General Water System Plan (SEPA19-10)** that was issued pursuant to the State Environmental Policy Act (SEPA) Rules, Chapter 197-11, Washington Administrative Code. The enclosed review comments reflect evaluation of the environmental checklist by the lead agency as required by WAC 197-11-330(1)(a)(i).

The following materials were submitted with the initial application:

- Application and fees
- SEPA Checklist

The application materials are available for review upon request from the Community Development Department.

Written comments may be submitted on this determination within fourteen (14) days of its issuance, after which the DNS will be reconsidered in light of the comments received.

Please address all correspondence to:

City of Camas, SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607
communitydevelopment@cityofcamas.us

Distribution:

Bureau of Indian Affairs
C-Tran
Camas School District
Camas City Administrator, Peter Capell
Camas Building Official, Bob Cunningham
Camas Community Development Director, Phil Bourquin
Camas Engineering Department Managers and Staff
Camas Fire Department, Randy Miller
Camas Finance Director, Cathy Huber Nickerson
Camas Mayor and City Council Members
Camas Parks and Recreation, Jerry Acheson
Camas Planning Commission Members
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Camas Police Chief, Mitch Lackey
Camas Public Works Director, Steve Wall
Camas Public Library, Connie Urquhart
Camas-Washougal Post Record
Chinook Indian Nation
Cultural Resource Program, Cowlitz Indian Tribe
Cultural Resource Program, Yakama Indian Nation
Clark County Department of Environmental Services
Clark County Public Works – Development Engineering Program
Clark County Department of Transportation
Clark County Natural Resources Council
Clark Public Utilities
Department of Ecology
Department of Fish and Wildlife, Region 5
Department of Natural Resources, SEPA Center
Southwest Clean Air Agency
US Army Corps of Engineers
Vancouver-Clark Parks and Recreation
Washington Office of Archaeology & Historic Preservation
Washington State Department of Transportation
Washington State Parks and Recreation Commission, Environmental Program

State Environmental Policy Act
Determination of Non-Significance

| | |
|---|---|
| **CASE NO:** | SEPA19-10<br>Camas General Water System Plan - Draft |
| **APPLICANT:** | The City of Camas<br>Sam Adams, Utility Manager<br>1620 SE 8th Avenue<br>Camas, WA 98607 |
| **REQUEST:** | The applicant is updating the General Water System Plan |

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| | |
|---|---|
| **LOCATION:** | CAMAS CITY LIMITS AND URBAN GROWTH BOUNDARY |
| **LEGAL DESCRIPTION:** | THE PLANNING AREA IS BOUNDED BY: PORTIONS OF TOWNSHIP 2 NORTH, RANGE 3E, SECTIONS 17, 20, 21, 27, 28, 29, 32, 33, 34, 35 AND 36; PORTIONS OF TOWNSHIP 1 NORTH, RANGE 3 E, SECTIONS 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 16; AND PORTIONS OF TOWNSHIP 1 NORTH RANGE 4E, SECTION 7, AND FURTHER DEFINED AS THE CAMAS CITY LIMITS. |
| **SEPA DETERMINATION:** | DETERMINATION OF NON-SIGNIFICANCE (DNS) |
| **COMMENT DEADLINE:** | JUNE 20TH, 2019, AT 5:00 P.M. |

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

**Determination:**

**Determination of Non-Significance (DNS).** The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

**Date of Publication & Comment Period:**

Publication date of this DNS is **June 6th, 2019**, and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **June 20th, 2019**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

**Responsible Official:** Robert Maul (360) 817-1568

| | |
|---|---|
| **Robert Maul, Planning Manager and Responsible Official** | **June 6th, 2019 Date of publication** |

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

# SEPA ENVIRONMENTAL CHECKLIST

***UPDATED 2016***

***Purpose of checklist:***

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants:***

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

***Instructions for Lead Agencies:***

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

***Use of checklist for nonproject proposals:*** [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

## A. Background [help]

1. Name of proposed project, if applicable: [help]

   City of Camas Water System Plan

2. Name of applicant: [help]

City of Camas

3. Address and phone number of applicant and contact person: [help]

1620 SE 8th Avenue, Camas, WA 98607
Sam Adams, Utilities Manager, 360-817-1567

4. Date checklist prepared: [help]

April 17, 2019

5. Agency requesting checklist: [help]

City of Camas, Planning Department

6. Proposed timing or schedule (including phasing, if applicable): [help]

N/A

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

None

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

There have been no environmental information prepared for the plan

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

N/A

10. List any government approvals or permits that will be needed for your proposal, if known. [help]

The Water System Plan must be adopted by ordinance by Camas City Council and be approved by the Washington State Department of Health

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The Water System Plan is a guidance and planning document for the City of Camas' water system. The document is used to help plan for water system upgrades and prepare for future growth.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

N/A

## B. ENVIRONMENTAL ELEMENTS [help]

**Note:** Section B. Environmental Elements does not apply to the City of Camas Water System Plan

### 1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

N/A

b. What is the steepest slope on the site (approximate percent slope)? [help]

N/A

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

N/A

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

N/A

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

N/A

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

N/A

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

N/A

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

N/A

**2. Air** [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

N/A

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

N/A

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

N/A

3. **Water** [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

N/A

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

N/A

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

N/A

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

N/A

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

N/A

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

N/A

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

N/A

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

N/A

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

N/A

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

N/A

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

N/A

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

N/A

4. **Plants** [help]

a. Check the types of vegetation found on the site: [help]

____deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
____shrubs
____grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered? [help]

N/A

c. List threatened and endangered species known to be on or near the site. [help]

N/A

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

N/A

e. List all noxious weeds and invasive species known to be on or near the site. [help]

N/A

5. **Animals** [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

b. List any threatened and endangered species known to be on or near the site. [help]

N/A

c. Is the site part of a migration route? If so, explain. [help]

N/A

d. Proposed measures to preserve or enhance wildlife, if any: [help]

N/A

e. List any invasive animal species known to be on or near the site. [help]

N/A

6. **Energy and Natural Resources** [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

N/A

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

N/A

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

N/A

7. **Environmental Health** [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

N/A

1) Describe any known or possible contamination at the site from present or past uses. [help]

N/A

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

N/A

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

N/A

4) Describe special emergency services that might be required. [help]

N/A

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

N/A

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? [help]

N/A

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site. [help]

N/A

3) Proposed measures to reduce or control noise impacts, if any: [help]

N/A

8. **Land and Shoreline Use** [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

N/A

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

N/A

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

N/A

c. Describe any structures on the site. [help]

N/A

d. Will any structures be demolished? If so, what? [help]

N/A

e. What is the current zoning classification of the site? [help]
N/A

f. What is the current comprehensive plan designation of the site? [help]
N/A

g. If applicable, what is the current shoreline master program designation of the site? [help]

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

i. Approximately how many people would reside or work in the completed project? [help]

N/A

j. Approximately how many people would the completed project displace? [help]
N/A

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

N/A

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

N/A

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]
N/A

9. **Housing** [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]
N/A

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

N/A

c. Proposed measures to reduce or control housing impacts, if any: [help]

N/A

10. **Aesthetics** [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

N/A

b. What views in the immediate vicinity would be altered or obstructed? [help]

N/A

b. Proposed measures to reduce or control aesthetic impacts, if any: [help]

N/A

11. **Light and Glare** [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

N/A

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

N/A

c. What existing off-site sources of light or glare may affect your proposal? [help]

N/A

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

N/A

12. **Recreation** [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

N/A

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

N/A

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

N/A

13. **Historic and cultural preservation** [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

N/A

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

N/A

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

N/A

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

N/A

14. **Transportation** [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

N/A

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

N/A

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

N/A

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

N/A

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help]

N/A

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

N/A

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

N/A

h. Proposed measures to reduce or control transportation impacts, if any: [help]

15. **Public Services** [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

The Water System Plan is a document that plans for the increase need for safe drinking water in the community.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

Without the Plan, there would be an impact to public services.

16. **Utilities** [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

N/A

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

N/A

## C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee SAM ADAMS

Position and Agency/Organization CITY OF CAMAS

Date Submitted: 4-22-19

## D. supplemental sheet for nonproject actions [help]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

The Water System Plan does include a Capital Improvement Program for the construction of system wide water improvements. When these projects are constructed over the next ten years there is a possibility of increase that increase will occur to the components listed above.

Proposed measures to avoid or reduce such increases are: Water system improvements when designed and constructed will follow all applicable laws and codes to reduce or avoid any increases.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

None known. The Water System Plan was developed to avoid any impacts to plants, animals, fish and marine life.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:
None

3. How would the proposal be likely to deplete energy or natural resources?

The Water System Plan in itself does not impact the environment. However, the plan does call for the development of more drinking water sources so implementation of the plan will have an impact on existing groundwater.

Proposed measures to protect or conserve energy and natural resources are:

Before any development of additional groundwater wells the City will conduct a thorough analysis of groundwater sources to assure they are sustainable and capable of recharging so they are not depleted.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

None Known

Proposed measures to protect such resources or to avoid or reduce impacts are: N/A

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

The Plan itself does not affect land and shoreline use. The plan outlines the projected growth in the City of Camas and projected water use. As a secondary affect, having a robust water supply does allow for land use to occure.

Proposed measures to avoid or reduce shoreline and land use impacts are: N/A

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

The Water System Plan will not increase demands for transportation. The plan was developed to meet the increased demands for water due to growth in the City of Camas. The plan forecasts population growth in Camas over next 20 years and the demand for drinking water.

Proposed measures to reduce or respond to such demand(s) are:

The Water System Plan has a capital improvement program to respond to future waters demands from growth.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

The Water System Plan is required by the Washington State Department of Health and was developed under their guidelines.

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

# Local Government Consistency Determination Form

Water System Name: City of Camas PWS ID: 108002

Planning/Engineering Document Title: _____ Plan Date: _____

Local Government with Jurisdiction Conducting Review: City of Camas

Before the Department of Health (DOH) approves a planning or engineering submittal under Section 100 or Section 110, the local government must review the documentation the municipal water supplier provides to prove the submittal is consistent with **local comprehensive plans, land use plans and development regulations** (WAC 246-290-108). Submittals under Section 105 require a local consistency determination if the municipal water supplier requests a water right place-of-use expansion. The review must address the elements identified below as they relate to water service.

By signing this form, the local government reviewer confirms the document under review is consistent with applicable local plans and regulations. If the local government reviewer identifies an inconsistency, he or she should include the citation from the applicable comprehensive plan or development regulation and explain how to resolve the inconsistency, or confirm that the inconsistency is not applicable by marking N/A. See more instructions on reverse.

| Local Government Consistency Statement | For use by water system: Identify the page(s) in submittal | For use by local government: Yes or Not Applicable |
|---|---|---|
| a) The water system service area is consistent with the adopted land use and zoning within the service area. | 3-16 | Yes |
| b) The growth projection used to forecast water demand is consistent with the adopted city or county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology. | 5-13 | Yes |
| c) For cities and towns that provide water service: All water service area policies of the city or town described in the plan conform to all relevant utility service extension ordinances. | 4-15, 6-9, 2-14, | yes |
| d) Service area policies for new service connections conform to the adopted local plans and adopted development regulations of all cities and counties with jurisdiction over the service area. | 2-24 | yes |
| e) Other relevant elements related to water supply are addressed in the water system plan, if applicable. This may include Coordinated Water System Plans, Regional Wastewater Plans, Reclaimed Water Plans, Groundwater Management Area Plans, and the Capital Facilities Element of local comprehensive plans. | 2-21 | yes |

I certify that the above statements are true to the best of my knowledge and that these specific elements are consistent with adopted local plans and development regulations.

Madeline Sutherland

Signature

10-9-19

Date

Madeline Sutherland, Assistant Planner, City of Camas

Printed Name, Title, & Jurisdiction

## Executive Summary

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/29/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 1 | Figure ES.1 | DOH | These maps label retail water service boundary, future water service boundary, and coordinated water system boundary. In order to define your water rights place of use and meet the requirements of WAC 246-290-100, the retail service area, future service area, and service area must be defined. **Please update these maps to include the required language.** | Maps throughout the Plan have been updated to appropriately reflect the service area. | Plan Figures have been updated. |

## Chapter 1 - Introduction

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/28/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 2 | Page 1-2 (Section 1.5) | DOH | This section states the Local Government Consistency checklist is in Appendix C, but Appendix C is labeled intertie agreement. **Please correct.** | Local Government Consistency Statements have been included in Appendix B. | Added Local Government Consistency Statements from Camas and and Clark County to Appendix B. |

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## Chapter 2 - Planning Considerations

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/29/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 3 | Figure 2.1 | DOH | Some mains extend beyond the service area boundary. Both Figure 2.1 and Figure 3.1 show zones extending outside of the service area. **Please clarify.** | Figure 2.1 and the text have been updated to explain the service areas. | Figure 2.1 has been updated to appropriately reflect the service area. |
| 4 | Page 2-20 (Section 2.6.2) | DOH | This section states the Clark County Coordinated Water System Plan is updated every five years. **Please discuss where the county is at in the updating cycle.** | Clark County is the lead agency for the Coordinated Water System Plan and can better answer your request. Reference to the five year updating cycle has been removed from the Plan. | Section 2.6.2 was revised to no longer refer to Clark County's update cycle. |
| 5 | Page 2-25 (Table 2.3) | DOH | This table states that Camas Municipal Water Sewer System (the City) will serve water to all customers within the retail service area. **Please detail if there is ever a time that the City will refuse a water connection to a prospective customer, or if a single family well could be allowed within the retail service area and under what circumstances.** | The City reserves the right to deny service to customers that are not able to meet City requirements. | Update Page 2-25. |
| 1 | Figure 2.1 | DOH | Map label retail water service boundary, future water service boundary, and coordinated water system boundary. In order to define your water rights place of use and meet the requirements of WAC 246-290-100, the retail service area, future service area, and service area must be defined. **Please update these maps to include the required language.** | Maps throughout the Plan have been updated to appropriately reflect the service area. | Figure 2.1 has been updated to appropriately reflect the service area. |

## Chapter 3 - Existing System

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/29/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 6 | Page 3-37 (Section 3.8) | DOH | The intertie agreement with Vancouver involves fire hydrants. This is not normally acceptable for potable supply. The agreement was not provided. The Status of the Department of Ecology's (Ecology's) approval of such agreements was not clear. **Please clarify.** | The report has been clarified that the Fire hydrants are for fire fighting purposes. | Page 3-37 has been updated with the clarification. |
| 3 | Figure 3.1 | DOH | Some mains extend beyond the service area boundary. Both Figure 2.1 and Figure 3.1 show zones extending outside of the service area. **Please clarify.** | Maps throughout the Plan have been updated to appropriately reflect the service area. | Figure 3.1 has been updated to appropriately reflect the service area. |

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## Chapter 4 - Operations and Maintenance

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/29/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 7 | Page 4-15 (Section 4.4) | DOH | **Please provide a copy of the emergency response plan.** | The Emergency Response Plan has been included in the Plan. | Appendix E has been updated to inlcude the latest emergency response plan |
| 8 | Page 4-19 (Section 4.8) | DOH | Many water systems are moving towards a framework of asset management. The asset management program serves as a road map for maintaining and replacing system assets at the most optimal time and cost. Additionally, many funding programs are moving towards requiring asset management plans as conditions of approval. This section details what could be the start of a robust asset management plan. Please consider implementing an asset management plan. For the purposes of this WSP, **please submit an asset inventory, include the installation date, estimated effective life, condition rating, criticality ranked, remaining useful life, replacement cost, inflation rate, and final cost on year of eventual replacement.** | The Plan document is based on the best available information. The City has ongoing major GIS update that is revising its asset inventory. The City's long-term goal is to create a risk prioritized water infrastructure rehabilitation program that addresses above and below ground assets. However, at this time, the City's financial resources are focused on meeting the rapid growth occuring in Camas. | Page 4-19 and 4-28 has be revised to state the City's long-term goal for a risk prioritized water infrastructure rehabilitation plan. |
| 9 | Figure 4.3 | DOH | This figure shows a Camas Water Boundary. **If this is the service area boundary or future service area, please show this on an updated figure. If this does not represent any service area, please clarify what it is referencing.** | Maps throughout the Plan have been updated to appropriately reflect the service area. | Figure 4.3 has been revised. |

## Chapter 6 - Water Use Efficiency

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/28/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 10 | Page 6-4 (Section 6.1.2) | DOH | This section references a water audit using American Water Works Association (AWWA) methodology to be done in 2018. **Please submit the findings of that audit or update us as to where you are in this process.** | The 2018 water audit has been included in Appendix L. | Page 6-4 has been updated to reference the 2018 Water Audit. |
| 11 | Page 6-5 (Section 6.2) | DOH | This section leaves the meeting of the consumer's date empty. **Please update.** | Date of the City Council Meeting has been added. | Page 6-5 has been updated with the consumer meeting date. Documenation from the meeting is provided in Appendix D. |

## Chapter 7 - Water Quality

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/28/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 12 | Page 7-18 (Section 7.4.1.2) | DOH | This section states the coliform monitoring plan (CMP) can be found in Appendix G. Appendix G is titled Water Rights Documentation and does not contain the CMP. Each water system plan shall include a CMP. **Please correct and submit your current coliform monitoring for review and approval, or indicate where the CMP is located in the plan.** | The Coliform Monitoring Plan has been added to Appendix E. | Updated Page 7-18 with correct reference (Appendix E) to Coliform Monitoring Plan. |

## Chapter 8 - Water Resources

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/28/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 13 | Page 8-4 (Section 8.1.2) | DOH | This section shows data from 2015 as being used for current data. **Please explain why you have chosen to use outdated data.** | The Plan was started in late 2016, where 2015 was the last full year of record and used in the analyses.<br>The Water Rights Self Assessment table has been updated for 2018 information. | Update Water Rights Self Assessment Table 1 in Appendix H. |

## Chapter 9 - System Analysis

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/28/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 14 | Page 9-19 (Section 9.4.1.3) | DOH | **Please provide documentation from the Fire Authority that has jurisdiction stating their requirements are being met.** | The City utility is responsible for dictating the general fire flows for future land use planning which had been developed in collaboration with the Fire Marshal. The Fire Marshal is responsible for dictating the specific fire flow requirements at the time of development. The City evaluates the ability to serve each new connect before utility permit is issued, where the developer is responsible for making improvements to meet site specific fire flows, as necessary. | Updated Page 9-29 regarding Fire Authority. |
| 15 | Page 9-51 (Section 9.6.4) | DOH | Installing individual booster pumps is one option to resolve pressure deficiencies. If this option is chosen, substantial purveyor control would be required. **Please elaborate on how control would be achieved.** | The individual booster pump will be owned and operated by the City allowing for close management and control. The City has extensive experience in operating and maintaining facilities on customer properties from its over 5,000 wastewater septic tank effluent pump stations. | Update Page 9-51 with control explanation. |

## Chapter 11 - Financial Plan

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/28/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 16 | Page 11-4 (Section 11.2) | DOH | This section demonstrates there is a combined water and sewer utility fund. ODW recommends the separation of utility funds. **Please provide an explanation as to why the City operates a combined utility fund.** | The City combined utility fund reflects historical integrations that are difficult to separate from an accounting perspective (bond issues, combined asset projects, etc.). The City's long-term goal is to seperate the accounting of its Utilities. Currently, all new assets are tracked seperately and the Utilities are operated seperately. | Updated Page 11-4 with explanation of combined utility fund. |
| 17 | Page 11-5 (Section 11.3.1) | DOH | This section states that additional revenue comes from penalties. **Please explain what penalties this is in reference to and any policies associated with the practice.** | Late fees or penalties are assessed on customers that are delinquent on water bill payments. | Updated Page 11-5 with explanation of the penalties. |

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## Appendix

**Project Name:** Water System Plan Update

**Client:** City of Camas

**Date Last Updated:** 10/29/2019

| Comment No. | Section/Page | Comment By | Comment | Response | Change to Plan |
|---|---|---|---|---|---|
| 18 | Appendix A | DOH | Prior to approval, this water system plan must be adopted by the City Council. **Please provide a copy of this resolution.** | Copy of the resolution was obtained from the City and added to Appendix A. | Resolution added to Appendix A. |
| 19 | Appendix B | DOH | This appendix is empty. **Please provide us with SEPA documentation.** | SEPA documents were obtained from the City and inluced in Appendix B. | SEPA documents added to Appendix B. |
| 20 | Appendix C | DOH | This appendix is empty. **Please provide all applicable intertie agreements.** | Applicable intertie agreements were obtained from the City and added to Appendix C. | Applicable intertie agreements added to Appendix C. |
| 21 | Appendix D | DOH | This appendix is empty. **Please provide minutes from the WUE goal setting meeting and proof of proper notification.** | WUE goal setting meeting minutes were obtained from the City and added to Appendix D. | WUE goal setting meeting minutes added to Appendix D. |
| 22 | Appendix K | DOH | Material requirements should be given for NSF 61 compliance and lead-free compliance. Drawings W16 and W18 show valves, which handle air exchange, but are subject to potential submersion. Air valve vents may not be submerged. **Please revise.** | Changes/clarifications were obtained from the City and Appendix K has been updated. | Updated Appendix K per the changes made by the City. |

# APPENDIX C – INTERTIE AGREEMENTS

# INTERLOCAL AGREEMENT: EMERGENCY INTERTIE BETWEEN WATER SYSTEM OPERATIONS OF THE CITY OF VANCOUVER AND THE CITY OF CAMAS

THIS AGREEMENT is made and entered into this 2nd day of ~~September~~ October, 2017, by and between the City of Camas, a municipal corporation of the State of Washington, and the City of Vancouver, a municipal corporation of the State of Washington, hereinafter referred to as the "Parties".

IN CONSIDERATION of the mutual promises, agreements, and covenants contained herein, it is hereby agreed, by and between the Parties, as follows:

## RECITALS

WHEREAS, the Parties have developed a Coordinated Water System Plan ("CWSP") pursuant to the Public Water System Coordination Act of 1977, RCW Chapter 70.116; and

WHEREAS, the CWSP designates individual water service areas to avoid unnecessary duplication; and

WHEREAS, the CWSP anticipates the development of physical interconnection of those water systems at points known as interties; and

WHEREAS, water system interties provide mutual benefits to water system operators by creating water supply redundancies; and

WHEREAS, the City of Vancouver and the City of Camas are authorized by Chapter 39.34 RCW, the Interlocal Cooperation Act, to enter into cooperative agreements to jointly exercise their powers, privileges and authorities; and

WHEREAS, the Parties are entering into this Agreement to provide water service to each other during emergency conditions.

NOW THEREFORE, the City of Vancouver and the City of Camas having entered into this Agreement by their signature, agree with the following:

### Section 1. PURPOSE

The purpose of this Agreement is to provide emergency water service to the requesting Party at a mutually acceptable intertie location. The intertie location is identified on Exhibit 'A.'

## Section 2. CONDITIONS OF SERVICE

A. Metering

A water meter that can serve water flowing in both directions will be installed at the intertie location. The City of Vancouver will set, own and maintain the water meter.

B. Other Infrastructure

Each purveyor will own and maintain the intertie infrastructure on its respective side up to the intertie meter, including all fittings, valves, pressure reducing valves, booster pumps, piping, electrical connections, and pressure gauges. The City of Vancouver will own and maintain the meter and the meter vault and all other associated appurtenances within the vault.

C. Cost of Service

The cost of the water supplied though an intertie shall be based on the supplying Party's then current service rates, as follows:

1. When the City of Camas supplies water to the City of Vancouver, the usage charge will be based on the most current schedule of rates for the size of the meter installed based on the Inside City Commercial rate.

2. When the City of Vancouver supplies water to the City of Camas, the usage charge will be based on the inside city limits commercial rate.

Charges will be limited to water usage. There will be no monthly or system development charges.

D. Service Limitations

The Parties will use the intertie only for emergency water service. Emergency water service is defined as service during any event that requires either Party's water supply to be augmented on a temporary emergency basis and is not intended to supply base or peak supply. Because this Agreement covers only emergency water service, there is no specific time period in which water will be provided; emergency water service may be requested at any time.

Either Party can refuse to provide emergency water service if such use could result in a degradation of water quality. The City of Vancouver and the City of Camas will monitor water quality at the intertie and each water purveyor will continue to be responsible for water quality monitoring within their system. Each Party shall immediately notify the other in the event of any failed coliform bacteria sample within the system and shall discuss any potential necessary actions.

Either Party can refuse to provide emergency water service if the water is needed for their own system.

Each Party shall use reasonable efforts to provide an uninterrupted supply of water. However, neither Party guarantees the availability of water through the intertie at all times because of each Party's respective needs and water demands. Further, either Party may close the intertie until sufficient water supply exists to make water available for use by the other Party.

The volume of water made available by the supplying utility will be dependent on the size of the intertie meter and the capacity available from the supplying water system.

Neither Party will be liable for any loss or damage attributed to their failure to provide water through the intertie.

Either Party can choose to abandon the intertie if the cost to alter, maintain or replace the connection exceeds the benefit to either Party.

The City of Vancouver and the City of Camas will work together to design, construct and maintain future interties where financially feasible.

Operation of the intertie shall be under the mutual consent of the City of Vancouver Water Operations Superintendent and City of Camas Utilities Manager. Each Party shall notify the other Party in writing at least twelve (12) hours in advance of the time either party desires to receive water through the intertie. Such notice shall be delivered in person to ensure it is timely received. If an emergency requires immediate use of the intertie, verbal notification and approval will be permitted, with follow-up written notification to occur as soon as practicable under the circumstances. Follow-up written notification of such emergency request shall be made by each Party to the other party within not more than three (3) days after the initiation of such emergency water usage. Upon receiving a request, the responding Party will provide available water service within a reasonable amount of time.

**Section 4. GENERAL TERMS**

A. Force Majeure

Notwithstanding anything contained in this Agreement to the contrary, neither Party will be deemed liable or to be in default for any delay or failure in performance under this Agreement deemed to result from acts of God, acts of civil and military authority, acts of public enemy, war, or any like cause beyond the Parties reasonable control.

B. Parties' Interests

Neither Party shall by virtue of this Agreement acquire any proprietary or governmental interest in the water system of the other Party. Each Party shall be solely responsible for the operation and maintenance of its own system of water distribution.

C. Water Use Efficiency Programs

Water use efficiency programs, data collection, water demand forecasting and other operational matters will be coordinated between the City of Vancouver and the City of Camas through the CWSP. Additional coordination activities are not necessary for emergency interties.

D. Severability

Should any provision of this Agreement be held by a tribunal of competent jurisdiction to be invalid or unenforceable, the remainder of the Agreement will remain in full force and effect.

E. Assignment

Neither Party shall assign this Agreement, or any rights under it, or delegate any obligations under it, without first obtaining the written consent of the other Party.

F. Amendments

This Agreement may only be changed, modified, or amended upon the unanimous written approval of both parties.

G. Third Parties

The terms of this Agreement are not intended to establish or create any rights in any persons or entities other than the Parties to this Agreement.

H. Employment Status

In providing services under this Agreement, none of the officers, officials, agents or employees of the parties hereto are employees of the other party to this Agreement for any purpose, including responsibility for any Federal or State tax, industrial insurance, or Social Security liability.

I. Administration

No new or separate legal or administrative entity is created to administer the provisions of this Agreement. This Agreement shall be administered by the respective parties to this

Agreement, which shall each be individually responsible for financing its own actions pursuant to this Agreement.

J. Choice of Law

This Agreement is made and entered in the State of Washington. Any dispute concerning its terms shall be determined by the courts of competent jurisdiction in and for Clark County, Washington.

K. Effective Date and Duration

This Agreement shall become effective upon the occurrence of the approval of this Agreement by the Parties' respective governing bodies, execution of this document by their authorized representatives, and recording with the County auditor. This Agreement shall remain in effect until terminated by either Party in accordance with this Agreement.

L. Termination

Either party may terminate this Agreement by providing sixty (60) days prior written notice to the other party. Upon termination, each party continues to own, is responsible for, and may dispose of the intertie infrastructure for which they are the designated owner through this Agreement.

M. Notices

Any notice to be given or any documents to be delivered by any party to the other shall be delivered in person or, if not urgent, sent by regular U.S. mail and addressed to the parties to this Agreement at the following addresses:

**For the City of Vancouver:**

Director of Public Works
City of Vancouver
415 W. 6th Street
P.O. Box 1995
Vancouver, WA 98668-1995

**For the City of Camas:**

Public Works Director
City of Camas
616 NE 4th Avenue
Camas, WA 98607

N. Entire Agreement

This Agreement comprises the entire understanding between the City of Vancouver and the City of Camas with respect to the subject matter hereof, and there are no representations, inducements, promises, or agreements, oral or otherwise, not embodied herein. Any and all prior negotiations, discussions, commitments, and understandings relating hereto are merged herein.

O. Counterparts

This Interlocal Agreement may be executed simultaneously in several counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument.

P. Filing

The Parties agree that there shall be two (2) duplicate originals of this Interlocal Agreement procured and distributed for signature by the necessary officials of the parties. Upon execution, one executed original of this Interlocal Agreement shall be retained by each Party. Within five (5) days from the date of execution of this Interlocal Agreement, the Parties will cause a copy of this Agreement to be filed with the County auditor in accordance with Chapter 32, Laws of Washington 2006 (RCW 39.34.040). Upon execution of the originals and filing of a copy with the County auditor, each such duplicate original shall constitute an agreement binding upon all Parties.

IN WITNESS WHEREOF, the parties have executed this agreement at Vancouver, Washington this 2nd day of September, 2017. October 3

CITY OF VANCOUVER

By: _____
City Manager

CITY OF CAMAS

By: _____
Mayor

Approved as to form:

_____
City Attorney

Attest:

_____
City Clerk

Approved as to form:

_____
City Attorney

Attest:

_____
City Clerk

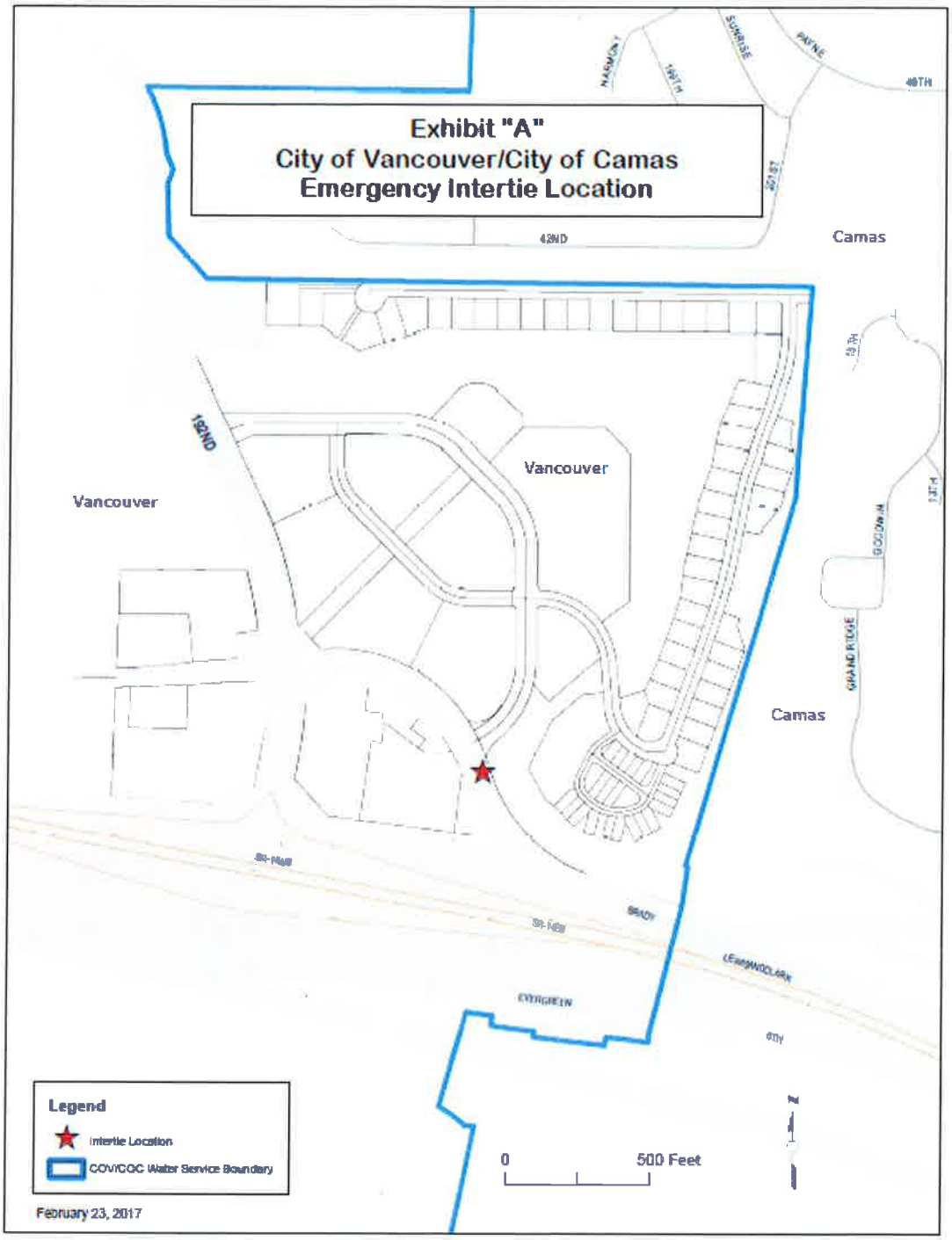


Exhibit "A"
City of Vancouver/City of Camas
Emergency Intertie Location
Camas
Vancouver
Vancouver
Camas
192ND
Legend
Intertie Location
COV/CGC Water Service Boundary
0
500 Feet
February 23, 2017

# INTERLOCAL AGREEMENT FOR ADJUSTING WATER UTILITY SERVICE BOUNDARIES AND WATER SERVICE SHUT OFF

## BETWEEN

## City of Vancouver and City of Camas

THIS AGREEMENT, entered into by and between City of Vancouver ("Vancouver") and City of Camas ("Camas"), (hereinafter referred to collectively as the Water Purveyors), WITNESS THAT:

WHEREAS, Clark County and the Water Purveyors conduct capital facilities and land use planning under the Growth Management Act as adopted by the State of Washington and subsequently amended; and

WHEREAS, RCW 70.116, *Public Water System Coordination Act*, and WAC 246-293-250 require development of a Coordinated Water System Plan, including establishment of service area boundaries by written agreement among purveyors; and

WHEREAS, the designation of water service area boundaries helps facilitate efficient planning and delivering of water services within Clark County, avoid unnecessary duplication of water services, and provide water operation predictability to the water purveyors, Clark County, and the residents served by the public water system; and

WHEREAS, the designation of water service area boundaries helps assure that available water supply sources of the Water Purveyors will be utilized in an efficient manner; and

WHEREAS, Vancouver and Camas entered an Interlocal Agreement for Adjusting or Confirming Future Water Utility Service Boundaries, effective January 10, 2012, which designated service area boundaries for the east boundary for Vancouver and the west boundary for Camas; and which was reviewed and approved by the Clark County Board of Commissioners pursuant to RCW 70.116.040; WAC 246-293-250; and 246-293-290; and

WHEREAS, without the installation of additional tanks and pumps, Vancouver cannot provide reliable water service at an adequate pressure to a portion of land currently located within Vancouver's water service area boundary, which is shown as the "Area Proposed to be Transferred to Camas" in Exhibit 'A' (hereinafter "Affected Area"); and

WHEREAS, Camas's water system has water supply at adequate pressure to provide the Affected Area with reliable water service; and

WHEREAS, it is in the best interests of Vancouver and Camas to make adjustments to the water service area boundaries such that Camas will now provide water service to the Affected Area; and

WHEREAS, Vancouver will provide sewer, stormwater and other municipal services within the Affected Area; and

WHEREAS, Vancouver engages in a lengthy process including multiple steps and actions to collect delinquent sewer and stormwater service charges. This process consists of the following, (1) past due reminder sent 25 days after the bill date to both the service address and the property owner of record, (2) past due final notice is sent 37 days after the bill date to both the service address and the property owner of record to notify that water service will be shut-off if payment is not received, (3) after the 45th day the account is past due, water service is shut-off, (4) after 12 months of non-payment, a notice of intent to file lien is mailed, (5) 30 days after the intent to file lien is sent, lien is filed with the Clark County Auditor and property owner notified, (8) after 24 months of non-payment, foreclosure process commences; and

WHEREAS, almost all of the delinquent sewer and stormwater service charges are paid during this lengthy collection process, and prior to the filing of a foreclosure action; and

WHEREAS, when other efforts fail, a cost effective mechanism for collecting payment of delinquent sewer and stormwater service charges is Vancouver's ability to shut off (terminate) water service to a property; and

NOW THEREFORE, in consideration of covenants, conditions, performances, and promises hereinafter contained the undersigned Water Purveyors hereto agree as follows:

## I. Purpose

The purpose of this Agreement is to adjust Water Service Area boundaries of the Water Purveyors that are parties to this Agreement and to provide a mechanism for shut off of water service by Camas at the request of Vancouver for delinquent sewer and/or stormwater service charges.

## II. Effective Date

This Agreement shall become effective upon the occurrence of the approval of this Agreement by the individual Water Purveyors' governing bodies, execution of this document by their authorized representatives, the approval of this Agreement by the Clark County Board of County Council, and recording with the County auditor.

## III. Duration

This Agreement shall remain in effect with regard to the individual Water Purveyors until terminated. Such termination shall occur through the establishment of future water service boundaries with the next update of the Coordinated Water System Plan.

## IV. Property

Nothing in this Agreement shall create or transfer any interest in real or personal property among Water Purveyors. In the event any adjustment of a Future Water Service Area boundary requires transfer of water facility assets from one Water Purveyor to another Water Purveyor, a separate written agreement shall address the transfer of such assets.

## V. Administration

No new or separate legal or administrative entity is created to administer the provisions of this Agreement. This Agreement shall be individually administered by the respective Water Purveyors, which shall each be individually responsible for financing its own actions under this Agreement.

## VI. Scope

1. **Service Area Boundaries**. The undersigned acknowledge that the map attached to this agreement identified as Exhibit 'A" clearly identifies the current western water service boundary for Camas and eastern water service boundary for Vancouver as well as the proposed water service boundary to be established through this Agreement. In addition, Exhibits B and C identify the final service boundaries for Vancouver and Camas, respectively, which will become effective upon execution of this Agreement. This signed Interlocal Agreement verifies that there are no service area conflicts with adjacent water utilities.

2. **Boundary Adjustments.** If, at some time in the future, it is in the best interests of the undersigned parties to make service area boundary adjustments, such modifications must have the written concurrence of all involved parties and the proper legislative authority/authorities, and must be noted and filed with Clark County and Washington State Department of Health.

3. **Water Service Shut Off.** After Vancouver has completed its delinquent sewer and/or stormwater service charge collection process for property that has delinquent charges, Vancouver's Public Works Director or designee may file a written request with the Camas Public Works Director or designee to shut off water service for such property. Upon receipt of the request, the Camas Public Works Director or designee will shut off the water service following the Camas procedure and requirements for shutting off water service for nonpayment of Camas water service charges. The water service shall remain shut off until the delinquent sewer and/or stormwater service charges, plus penalties, interest and fees, have been paid in full or the property owner and Vancouver have entered into a payment arrangement. The Vancouver Public Works Director or designee shall notify the Camas Public Works Director or designee when the charges have been

paid in full or the payment arrangement has been entered into. Vancouver estimates that requests to shut off water service will be infrequent.

### VII. Interpretation

This Agreement has been and shall be construed as having been made and delivered in the State of Washington and it is mutually agreed and understood by the Water Purveyors that this Agreement shall be governed by the laws of the State of Washington. Venue for any lawsuit arising from or related to this Agreement shall be the Superior Court of Clark County, Washington.

### VIII. Amendments/Modification

The provisions of this Agreement may be amended only upon the mutual consent of the Water Purveyors. No amendments to the terms of this Agreement shall be valid unless made in writing and formally approved and executed by the duly authorized agents of the Water Purveyors and Clark County, and recorded with the Clark County Auditor.

### IX. Severability

If any section or part of this Agreement is held by a court to be invalid, such action shall not affect the validity of any other part of this Agreement.

### X. Entire Agreement

This Agreement contains all of the agreements of the Water Purveyors with respect to the subject matter covered or mentioned herein, and no prior Agreement shall be effective to the contrary.

### XI. Counterparts

This Interlocal Agreement may be executed simultaneously in several counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument.

### XII. Document Filing

The Water Purveyors agree that there shall be one (1) original of this Agreement procured and distributed for signature by the necessary officials of the Water Purveyors. Upon execution, this Agreement shall be retained by the Clark County Community Planning and each Water Purveyor shall retain one (1) copy. The Parties shall cause a copy of this Agreement to be recorded with the Clark County Auditor.

As specified in WAC 246-293-250, Service Area Agreements-Requirements, this Agreement shall become effective once this document is approved by the Clark County

Board of County Council. The Parties will ensure this Agreement is filed with the County auditor within five (5) days of approval by the Clark County Board of County Council.

This Interlocal Agreement for Adjusting Water Utility Service Boundaries and Water Service Shut Off is hereby approved.

CITY OF VANCOUVER

By: _____
City Manager

CITY OF CAMAS

By: _____
Mayor

Approved as to form:

_____
City Attorney

Approved as to form:

_____
City Attorney

Attest:

_____
City Clerk

Attest:

_____
City Clerk

APPROVED BY CLARK COUNTY BOARD OF COUNTY COUNCIL, CLARK COUNTY, WASHINGTON

_____
Marc Boldt, Chair

_____
John Blom, Councilor

_____
Jeanne E. Stewart, Councilor

_____
Eileen Quiring, Councilor

_____
Julie Olson, Councilor

Resolution No. —

Date: 10-24-17

APPROVED AS TO FORM ONLY:
Anthony F. Golik, Clark County Prosecutor

By: _____
Christine Cook, Senior Deputy Prosecuting Attorney

CLARK COUNTY, WASHINGTON 1844

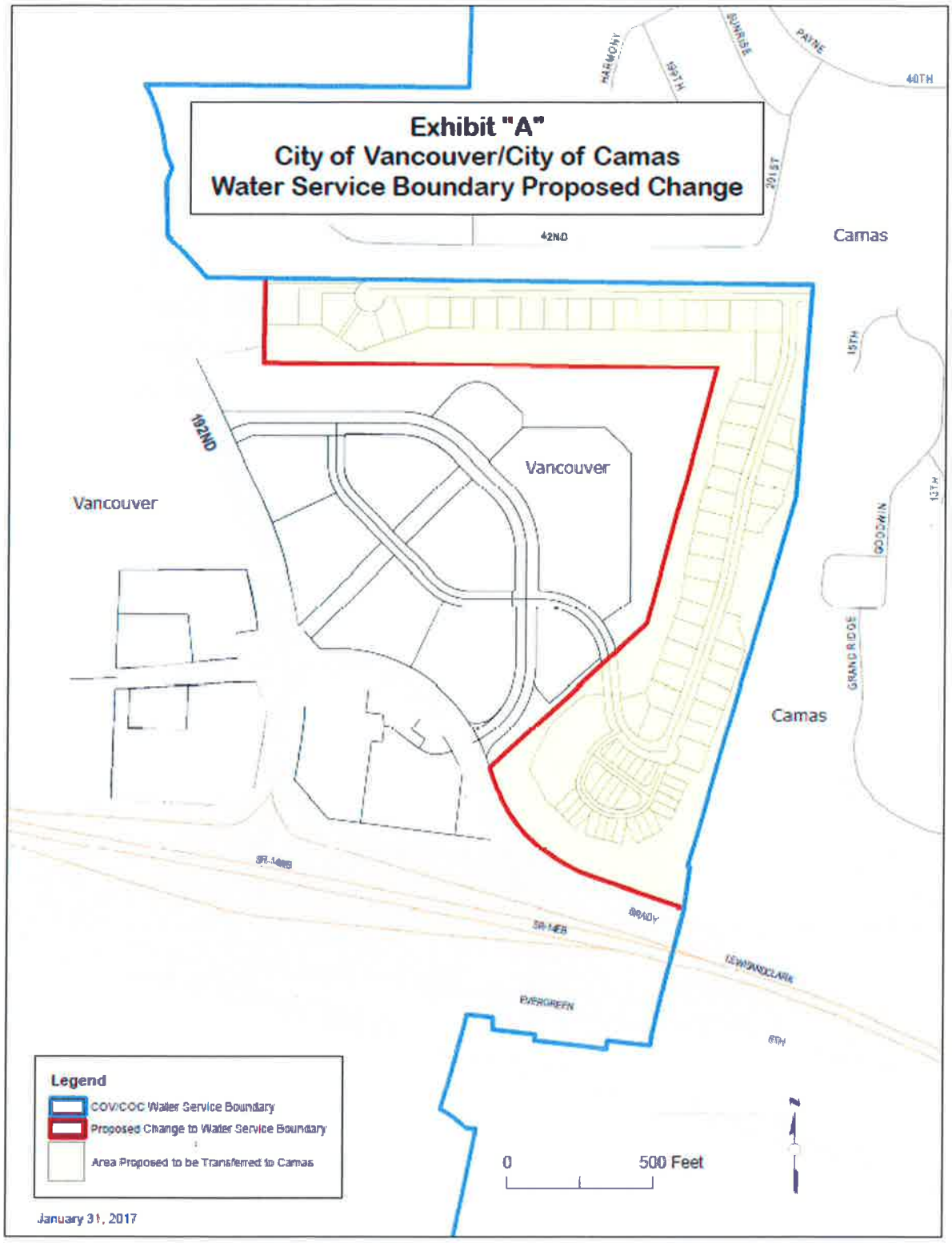
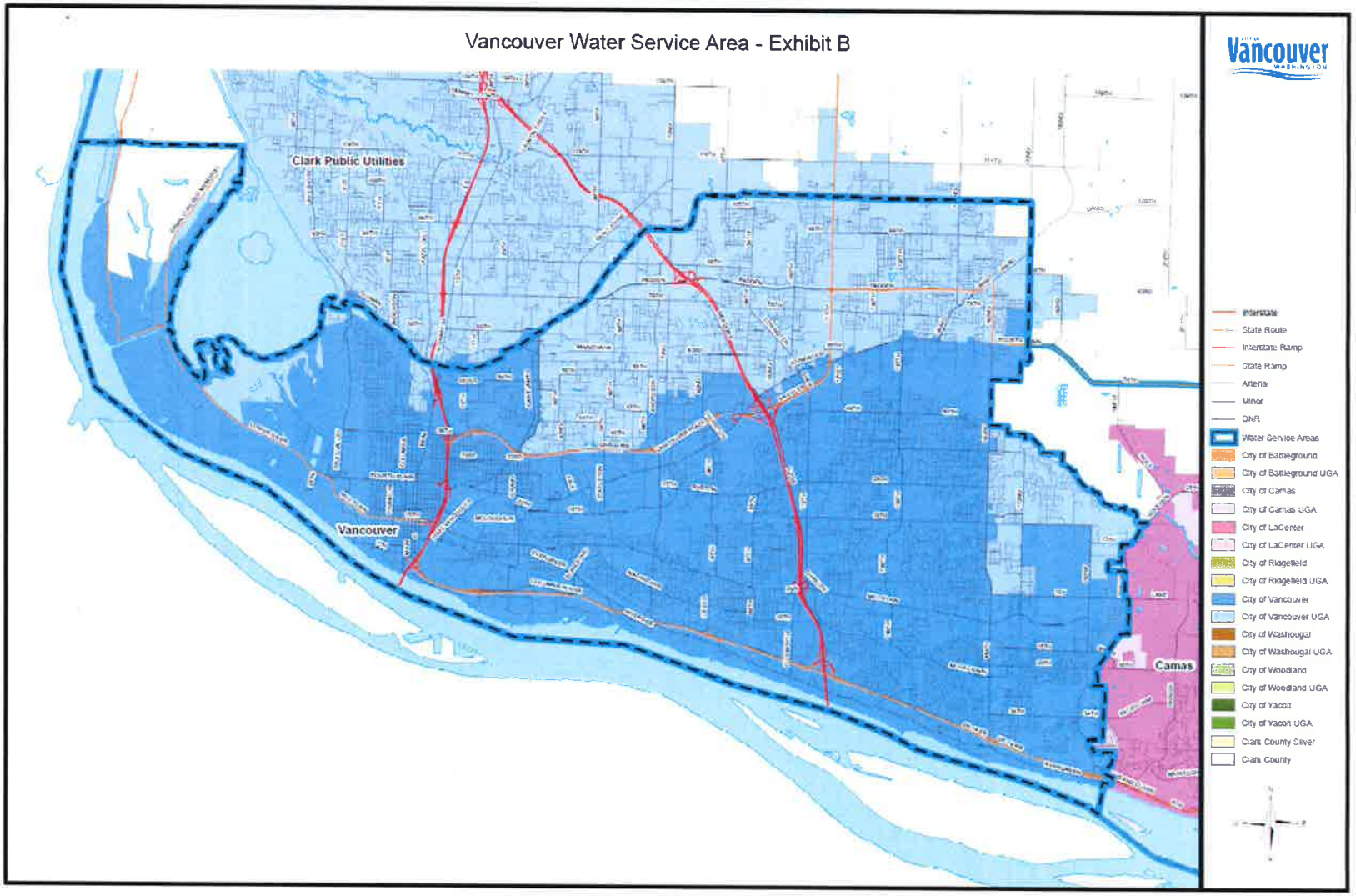
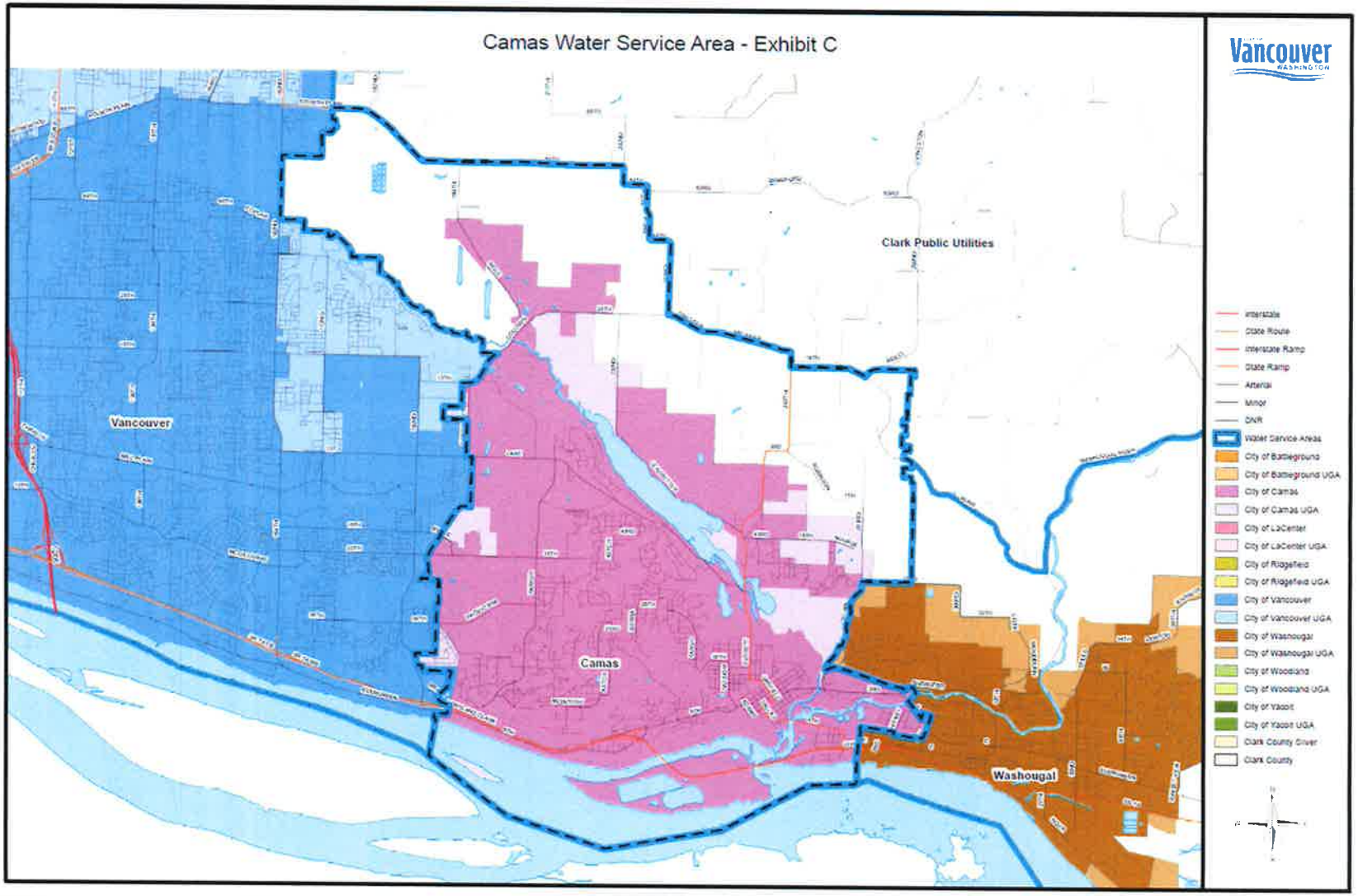


Exhibit "A"
City of Vancouver/City of Camas
Water Service Boundary Proposed Change
Camas
Vancouver
Vancouver
Camas
192ND
42ND
40TH
PAYNE
SUNRISE
HARMONY
199TH
201ST
15TH
137TH
GODWIN
GRANGRIDGE
BRADY
EVERGREEN
6TH
Legend
COV/COC Water Service Boundary
Proposed Change to Water Service Boundary
Area Proposed to be Transferred to Camas
0
500 Feet
January 31, 2017


Vancouver Water Service Area - Exhibit B
Clark Public Utilities
Vancouver
Camas
Vancouver
WASHINGTON
Interstate
State Route
Interstate Ramp
State Ramp
Arterial
Minor
DNR
Water Service Areas
City of Battleground
City of Battleground UGA
City of Camas
City of Camas UGA
City of LaCenter
City of LaCenter UGA
City of Ridgefield
City of Ridgefield UGA
City of Vancouver
City of Vancouver UGA
City of Washougal
City of Washougal UGA
City of Woodland
City of Woodland UGA
City of Yacolt
City of Yacolt UGA
Clark County Sewer
Clark County


Camas Water Service Area - Exhibit C
Vancouver
WASHINGTON
Clark Public Utilities
Vancouver
Camas
Washougal
Interstate
State Route
Interstate Ramp
State Ramp
Arterial
Minor
DNR
Water Service Areas
City of Battleground
City of Battleground UGA
City of Camas
City of Camas UGA
City of LaCenter
City of LaCenter UGA
City of Ridgefield
City of Ridgefield UGA
City of Vancouver
City of Vancouver UGA
City of Washougal
City of Washougal UGA
City of Woodland
City of Woodland UGA
City of Yacolt
City of Yacolt UGA
Clark County Other
Clark County

# INTER-LOCAL COOPERATION AGREEMENT

THIS AGREEMENT made this day by and between the CITY OF CAMAS, a municipal corporation organized under the laws of the State of Washington, hereinafter referred to as "Camas", and the CITY OF WASHOUGAL, a municipal corporation organized under the laws of the State of Washington, hereinafter referred to as "Washougal",

In accordance with the Inter-Local Cooperation Act (RCW Chapter 39.34), Camas and Washougal, in consideration of the payments, covenants and agreements hereinafter mentioned, to be made and performed by the parties, do covenant and agree as follows:

Section 1. **PURPOSE:** The purpose of this agreement is to allow Camas and Washougal to sell water to the other due to the occurrence of an emergency situation where either city is unable to meet their service demands within internal water sources. The designation of an emergency shall be made by the respective Public Works Directors of each city and shall include, but not be limited to, drought conditions or a break in a water main. The delivery of water upon the designation of an emergency shall be through Inter-Ties between the respective water systems of Camas and Washougal at locations approved by the Public Works Directors of each city.

Section 2. **DURATION:** This agreement shall be for an indefinite duration.

Section 3. **ADMINISTRATION:** No new or separate legal or administrative entity is created to administer the provisions of this agreement. This agreement shall be administered jointly by Camas and Washougal by and through the Public Works Directors of both cities, who shall jointly administer this undertaking in accordance with the terms and conditions of this agreement.

Section 4. **FINANCING:** In the event either Camas or Washougal receives water

pursuant the provisions of this agreement then the receiving city shall remit payment in full for the water received at a rate equivalent to the receiving city's residential, inside city, water volume rate at the time of provision of the water. Invoicing shall be on a monthly basis.

Section 5. **WATER QUALITY:** The water supplied by either Camas or Washougal, in accordance with the terms of this agreement, shall be deemed "finished and treated" drinking water at the point of delivery. The city providing water shall have no responsibility to maintain drinking water quality standards once the water has been provided to the receiving city's distribution system. The receiving city shall be solely responsible to maintain drinking water quality standards upon receipt.

Section 6. **INDEMNIFICATION:** Camas and Washougal shall indemnify and hold harmless the other, its officers, agents, and employees, or any of them, from any and all claims, actions, suits, liability, loss, costs, expenses and damage of any nature whatsoever, by reason of or arising out of any action or omission of the respective employees, officers and agents, in the execution and administration of this agreement.

Section 7. **INSURANCE:** Each city shall obtain and keep in full force and effect liability insurance protecting itself and its employees, officers and agents, and the party, its employees, officers and agents, for claims of any persons for injuries to life, person or property by reason of anything done or permitted to be done or suffered or admitted to be done by the parties in the administration of the project. If either party withdraws from the Washington Cities Insurance Authority, that party shall deliver a certificate of insurance showing compliance with this section.

Section 8. **TERMINATION:** Each party shall have the right to terminate this entire agreement, with or without cause, upon 180 days written notice to the other party. Such notice shall be sufficient if it is in writing and deposited in the United States mail, certified mail, return receipt requested, with postage fully prepaid and addressed to the parties at their last known addresses as follows:

City of Camas
P.O. Box 1055
Camas, WA 98607

City of Washougal
1701 "C" Street
Washougal, WA 98671

Section 9. **FILING:** This agreement shall be filed with the city clerks of Camas and Washougal and with the Clark County Auditor and the Washington Secretary of State.

Section 10. **EFFECTIVE DATE:** This agreement shall be effective upon signing by the respective parties hereto.

DATED this 7 day of August, 2006.

CITY OF CAMAS

By: _____
Mayor

Attest: _____
Clerk

Approved as to form:
_____
City Attorney

CITY OF WASHOUGAL

By: _____
Mayor

Attest: _____
Clerk

Approved as to form:
_____
City Attorney

CITY OF CAMAS
616 Northeast Fourth Avenue
P.O. Box 1055
Camas, Washington 98607



October 8, 1997

Mike Conway, Director
Department of Public Works
City of Washougal
1701 C Street
Washougal WA 98671

Gentlemen/Mike

Enclosed please find an executed copy of the *INTERLOCAL AGREEMENT BETWEEN the CITY OF WASHOUGAL and the CITY OF CAMAS.* Said agreement designates the City of Washougal as the utility service (water and sewer) provider to the land located north of the intersection of Shepherd Road and 3rd Avenue.

Any questions pertaining to this agreement may be directed to Eric Levison, our Assistant City Engineer, at 834-3451.

Sincerely,

Douglas A. Quinn, P.E.
Director

enclosure

**INTERLOCAL AGREEMENT BETWEEN**
**the**
**CITY OF WASHOUGAL and the CITY OF CAMAS**

The corporate limits of the cities of Camas and Washougal are irregular along their common boundary. In particular, an area within the Camas corporate limits (herein referred to as "subject area", as described in attached Exhibit "A") located north of the intersection of Shepherd Road and 3rd Avenue is currently surrounded on approximately eighty-four (84) percent of its perimeter by Washougal's corporate limits.

Further, the cities have mutually entered into an Interlocal Agreement which designates the City of Washougal as the utility service (water and sewer) provider to the land located within the subject area.

The City of Washougal is in the process of preparing a Comprehensive Subarea Plan for an area lying north of the subject area, including the land surrounding the subject area. The Subarea Plan will address land uses, environmental protection, storm water drainage and infrastructure impacts for the area. Including the subject area would assure the orderly and logical progression of land development under the jurisdiction of the City of Washougal.

The purpose of this agreement is to establish the City of Washougal as the presiding jurisdiction with respect to land use planning and implementation, including, but not limited to the following:

1. Implementation of land division regulations.
2. Imposition and implementation of zoning regulations
3. Implementation of development standards, including streets, storm and sanitary sewer, water and other utility provision.

Pursuant to this, the City of Washougal and the City of Camas hereby agree to the following:

1. Presiding Jurisdiction. The City of Washougal shall be the presiding jurisdiction in all planning programs, land use designations and land use application processing for land within the subject area.

2. Land Use Planning and Implementation. All land use actions shall be processed under the rules and regulations of the City of Washougal, including but not limited to Titles 15 (Building), 16 (Environmental), 17 (Land Divisions) and 18 (Zoning) of the Washougal Municipal Code, the City of Washougal Engineering Standards for Public Works Construction and any and all provisions of the Woodburn Hill Comprehensive Subarea Plan. No provision of this agreement shall preclude future revisions, amendments or addenda to these regulations from being implemented by the City of Washougal within the subject area without prior written consent of the City of Camas.

3. Annexation. Both the City of Camas and the City of Washougal agree to pursue the necessary routes to transfer true corporate jurisdiction for the subject area from the City of Camas to the City of Washougal.

4. Effective Date and Duration. This agreement shall be effective upon signature by the presiding officer of both the City of Camas and the City of Washougal, and shall be in effect until terminated by one of the following methods:

   a. Ninety (90) day written notice of termination by either party subject to the agreement.
   b. Termination of agreement upon formal annexation of the subject area by the City of Washougal, said termination being effective concurrent with the effective date of the annexation.

5. Application Processing Upon Termination. Upon termination of this agreement, the city of Washougal shall complete processing of any technically complete land use application filed with the City of Washougal pursuant to the provisions of this agreement.

APPROVED this 4th day of August, 1997 by:

City of Washougal

Mayor Charles Crumpacker

City of Camas

Mayor Dean Dossett

Approved as to form:

City of Washougal

Don English, City Attorney

City of Camas

Roger Knapp, City Attorney

f:\eric\woodburn\intrlocl

AFTER RECORDING RETURN TO:

City of Washougal
1701 "C" Street
Washougal, WA 98671

# CITIES OF CAMAS AND WASHOUGAL, WASHINGTON

# UTILITIES COOPERATION AGREEMENT FOR WATER SYSTEM DEVELOPMENT – PHASE 2

# 2015

**CONTENTS**

# CITIES OF CAMAS AND WASHOUGAL, WASHINGTON
# UTILITIES COOPERATION AGREEMENT
# FOR WATER SYSTEM DEVELOPMENT
# PHASE 2

## 1. AGREEMENT

This Utilities Cooperation Agreement for Water System Development ("Agreement") is made by and between the CITY OF CAMAS, a Washington municipal corporation ("Camas"), and the CITY OF WASHOUGAL, a Washington municipal corporation ("Washougal"). Camas and Washougal are each a "Party" and collectively the "Parties" (or "Cities") to this Agreement. The Parties agree as follows.

## 2. RECITALS

2.1 This Agreement is entered by the Parties under their authority to contract, including but not limited to RCW 35A.11.010 and RCW 35.21.210.

2.2 For a number of years, Camas and Washougal have been jointly addressing the Parties' ongoing water supply needs. The Cities participated in Water Resource Inventory Area (WRIA) planning in the Salmon-Washougal (WRIA 28) and Lewis (WRIA 27) watersheds. Clark, Cowlitz and Skamania Counties adopted the Salmon-Washougal & Lewis Watershed Management Plan on July 21, 2006. The Salmon-Washougal & Lewis Watershed Management Plan guides future water rights development in the community, and identifies the Steigerwald area in Clark County as a regional water source.

2.3 Washougal identifies current average daily water demand of approximately 2.0 million gallons per day, with an estimated 50-year need of 10 million gallons per day. Camas identifies current average daily water demand of approximately 3.7 million gallons per day, with an estimated 50-year need of 15 million gallons per day. To meet these needs, the Parties initiated efforts to develop and operate water system wells and well fields near the Steigerwald Wildlife Refuge to be supplied by the Pleistocene Alluvial Aquifer (the "Project").

2.4 The Parties began Project development efforts at Phase 1, in part, by entering into an Option to Purchase Exclusive Easement for Well Site with the Port of Camas-Washougal ("Port," July 17, 2006 (now expired)), and Inter-Local Cooperation Agreement (July 17, 2006) between the Parties to provide for drilling, testing, and evaluation of drinking water wells in the Steigerwald Lake area. The testing revealed sufficient water supplies for the Project. The 2011 Clark County Coordinated Water System Plan Update identifies the Steigerwald well field as a regional water source and further identifies it as a capital project (SR-11).

2.5 As components of the Project, the Parties now are (i) jointly seeking new water rights sufficient for the Project under an Application for Water Right Permit (Washington Ecology No. G2-30528, August 2009); (ii) acquiring from Port the property rights necessary for the Project; (iii) updating their comprehensive water plans; and, (iv) planning to acquire, develop

and operate necessary water system facilities and improvements. Collectively, these efforts and this Agreement are Phase 2 of the Project.

2.6 The Camas 2010 Water System Plan identifies the Steigerwald well field as a regional water source and further identifies it as a capital project (SR-11). The Washougal Water System Plan identifies the Steigerwald well field as a regional water source and further identifies it as a capital project. Camas intends to update its Water System Plan by 2016. Washougal intends to update its Water System Plan, beginning in 2017.

2.7 The Steigerwald well field site is to be acquired and developed by the Parties, with Washougal acting as lead agency and title holder. The general allocation of rights and responsibility for the Project is 60% to Camas and 40% to Washougal.

2.8 In accordance with their history of cooperation and consistent with the 2006 Inter-Local Agreement for good faith negotiations toward a revised agreement to allocate the costs and distribution of Project water resources, the Parties enter into this Agreement to terminate the 2006 Inter-Local Agreement, except as it relates to unreimbursed costs otherwise allocated thereto which shall be subject to further negotiations, and to set forth the rights and obligations of the Parties for the next phase of the Project. This is another in a series of agreements, and the Parties will consider in the future Phase 3 and other forms of management and/or governance of water systems, including the potential of forming a joint municipal services authority under Chapter 39.106 RCW. This Agreement also provides a protocol in the event future agreements are not reached.

## 3. DEFINITIONS

3.1 "Capacity Allocation" means the percentage of the Steigerwald Water System's design capacity that a Party is authorized by this Agreement to use. A Capacity Allocation does not convey ownership interest in any of the Steigerwald Water System.

3.2 "Steigerwald Water System" or "Project" means the Real Property and System Facilities subject to this Agreement.

3.3 "Real Property" means that certain real property located in Clark County, Washington, identified as Clark County Tax parcel No. 135307000, consisting of approximately 19.65 acres of land, which is legally described and generally depicted in Exhibit A.

3.4 "System Facilities" means all water system facilities and improvements located on the Real Property and, to the extent agreed upon by the Parties in the future, any other facilities that Camas or Washougal may construct for joint use by the Parties, including without limitation facilities not located on the Real Property.

## 4. OWNERSHIP OF THE STEIGERWALD WATER SYSTEM

4.1 Capacity Interest and Allocation. Each Party owns a capacity interest in the Steigerwald Water System. The Camas capacity interest and Capacity Allocation is 60% and the Washougal capacity interest and Capacity Allocation is 40%.

4.2 Title to Property. Title to the Real Property shall be held in the name of the City of Washougal. Each Party's interest in the Real Property is defined in this Agreement by its Capacity Allocation.

4.3 Sale of Property. The Real Property, the Steigerwald Water System or any part of either the Property or System may be sold or transferred upon the written approval of both Parties, subject to any rights held by the Port of Camas-Washougal, if then applicable.

## 5. ALLOCATION OF COSTS, SYSTEM CAPACITY, AND WATER RIGHTS

5.1 Purchase Price. Each Party is obligated to pay its portion of the total purchase price for the Real Property (estimated to be $667,619.90 plus costs), divided as follows: Camas – 60% / Washougal – 40%. The allocable share of the Purchase Price shall be included in each Party's capital contributions if the Real Property is purchased over a term of years. Camas shall pay its share to Washougal under Agreement Section 7. Camas' payments for the real property are an obligation of Camas' water system and shall be considered as junior debt for the water utility.

5.2 Capacity Allocation. Subject to modification in future agreement, each Party's Capacity Allocation is divided as follows: Camas – 60% / Washougal – 40%.

5.3 Water Rights. Subject to modification in future agreement, each Party's interest in the water rights associated with the Steigerwald Water System is divided as follows: Camas – 60% / Washougal – 40%.

## 6. ADMINISTRATION

6.1 Administration.

6.1.1 Lead Agency. No new or separate legal or administrative entity is created by this Agreement. Washougal serves as lead agency for Project. As lead agency, Washougal shall be responsible for continued process for the Application for Water Right Permit, Real Property acquisition, Project design and Development and other Project related actions, all upon consultation with Camas.

6.1.2 Meetings/System Planning. The Public Works Director of each City shall meet regularly, generally monthly, regarding the Project. Additionally, the Parties shall hold regular meetings, to direct planning related to the Steigerwald Water System and to develop and review future actions, including relevant comprehensive plans, other planning documents and budgets. Each Party shall cooperate with the other Party's water comprehensive planning.

6.1.3 Phase 3. Following the adoption by each Party of the Party's updated water comprehensive plan, or earlier as the Parties determine, the Parties shall begin negotiations for development of a Phase 3 agreement. A Phase 3 agreement is to address the next phase of the water resource development and System Facilities, and System management. A Phase 3 agreement is expected to address such issues as organization and governance; budget and finance; water interties and wheeling; System Facilities planning and development; management and operation; repair and replacement of System Facilities; termination of this

Agreement; and related matters. The Parties intend to enter a Phase 3 Agreement no later than eighteen (18) months following the commencement of negotiations. Each Party commits to good faith and diligent effort to reach a Phase 3 agreement.

6.2 Other Uses. The Real Property is acquired by the Parties for development and operation of well fields and other utility purposes. The Parties may, however, agree to make the Real Property available for either or both Parties' general municipal purposes.

6.3 Water Rights Approval Process. In the event the Parties determine to request accelerated review of their Application for Water Right Permit, all costs of such process shall be allocated between the Parties based on Capacity Allocation.

## 7. BUDGETING AND INVOICING

7.1 Invoicing and Payment. Monthly, as expenses are incurred, Washougal will invoice Camas for its pro rata share of costs for the Project in accordance with Washougal's standard invoicing procedures for public works projects. Camas must remit payment in full for each invoice no later than thirty (30) days after the receipt of the invoice from Washougal.

7.2 Reimbursement. It is the intent of the Parties that Washougal be reimbursed for (and Camas pay for) only Camas' pro rata share of costs reasonably incurred by Washougal in performing its duties under this Agreement.

7.3 Taxes. Washougal shall not assess its utility tax on revenues from any service to Camas under this Agreement. Other taxes such as state, county and those imposed by other third parties related to the Project shall apply. Each Party retains all rights and authority to levy and collect utility taxes associated with retail or contract water service.

## 8. DISPUTE RESOLUTION

8.1 Negotiations. The Parties agree to make all reasonable efforts to resolve through informal, good faith negotiations any disputes concerning the terms and conditions or performance of this Agreement. In the event of a dispute, including a claimed breach of this Agreement, notice of the dispute shall be provided in writing and shall be delivered in the manner set forth in Section 12.4. The notice shall set forth with reasonable specificity the factual basis for the claimed dispute. Both Parties shall jointly cooperate to informally resolve any disputes as quickly and efficiently as possible, but in any event not more than sixty (60) days from the date of the notice unless extended by mutual agreement of the Parties.

8.2 Voluntary Mediation. If a dispute cannot be resolved through direct discussions, mediation may, by mutual consent, be initiated. In the event the Parties determine to initiate mediation, a mutually acceptable mediator shall be selected by the Parties for the purpose of facilitating the mediation process. The mediator shall be selected based on his or her expertise with the nature of the matter in dispute and their ability to facilitate a settlement. The Parties agree to provide all documentation and information requested by the mediator and in all other regards to cooperate fully with the mediator. The costs of mediation shall be shared equally between the Parties.

8.3 Other Relief. In the event the dispute is not resolved in mediation, or the Parties do not agree to mediation, the Parties may pursue any other form of relief provided by this Agreement.

8.4 Specific Performance. If a Party continues in default in the performance of any material and substantial covenant or agreement herein contained for a period of thirty (30) days after written notice specifying such default, and following such reasonable time under Agreement Sections 8.1 and 8.2; or as is necessary to cure such default or a Party's failure to commence a cure within sixty (60) days of notice, a Party may, at its option, immediately commence an action for specific performance to compel performance or take any other action available at law or in equity, including an action for damages. The Parties agree that the continued delivery of water from the Steigerwald Water System cannot be terminated without jeopardizing the public health and safety. As a result, termination of the Agreement is not an adequate remedy; and an action for specific performance, in addition to other remedies, is authorized to compel performance under this Agreement.

8.5 Compliance with Order. The Parties shall be bound by the outcome of litigation (or other process) under Agreement Section 8, including all appeals, at the conclusion of the litigation (the "Order"). The first remedy available to a Party under an Order shall be specific performance. If a Party does not comply with the Order within the time specified for compliance in the Order, the prevailing Party may elect to terminate the Agreement without further process under this Agreement. If a Party chooses to not terminate the Agreement, the Party may pursue such other remedies as are available under law or this Agreement.

8.6 Force Majeure. No period of performance required by this Agreement shall run during periods of force majeure.

8.7 No Waiver; Prevailing Party Costs. If a Party incurs attorney fees, costs, or other legal expenses to enforce the provisions of this Agreement against another Party, all fees, costs, and expenses are recoverable by the prevailing Party as against the offending Party. The failure of a Party to exercise any right or enforce any provision of this Agreement is not a waiver of that right or enforcement remedy.

8.8 Jurisdiction and Venue. This Agreement must be interpreted in accordance with the laws of the state of Washington. As against the other Party, Camas and Washougal may file suit to enforce this Agreement only in the Superior Court for Clark County, Washington.

## 9. ASSETS

9.1 Existing Assets. Subject to Agreement Section 4, this Agreement does not transfer any existing assets between the Parties. The Parties retain all rights, title, and interest in their separate municipal water systems, including without limitation all real and personal property, investments, cash accounts and reserves, and contract and intangible rights.

9.2 Steigerwald Water System Assets. The Parties each have an ownership interest in the assets of the Steigerwald Water System based on Capacity Allocation. Upon termination or dissolution of this Agreement, the Parties will work in good faith toward an asset allocation plan for the Steigerwald Water System and to administer the approved plan. In the event the Parties

cannot reach agreement, then Washougal shall pay to Camas the full amount of prior Camas payments to Washougal for the Real Property and any System Facilities constructed prior to Agreement termination. After payment by Washougal, Camas shall have no interest in the Steigerwald Water System.

## 10. INSURANCE

10.1 Property Insurance. Washougal must insure, at replacement cost value, any Steigerwald Water System Facilities.

10.2 Liability Insurance. Each Party shall obtain and keep in full force and effect liability insurance protecting itself and its employees, officers and agents, and the party, its employees, officers and agents, for claims of any persons for injuries to life, person or property by reason of anything done or permitted to be done or suffered or admitted to be done by the parties in the administration of the project. If either party withdraws from the Washington Cities Insurance Authority, that party shall deliver a certificate of insurance showing compliance with this section.

10.3 Cost. Any additional cost for liability, property or other insurance required for the System will be included as an operating cost and payable by each Party under Capacity Allocation.

## 11. UTILITY TAXES

The Parties recognize that the Steigerwald Water System is being developed to provide wholesale water supplies to the Parties. Accordingly, revenues generated by the Steigerwald Water System, if characterized as such, are exempt from certain taxes. Each Party will therefore pay its own share of utility taxes, when owed, for revenue generated by their separate municipal water utilities.

## 12. GENERAL

12.1 Execution of Documents. The Parties will cooperate fully in executing documents that are necessary to develop and implement the Steigerwald Water System.

12.2 Filing. Prior to or on the Effective Date, the City Clerks of Camas and Washougal must list this Agreement by subject on that city's website or other electronically retrievable public sources. Washougal shall record this Agreement with the deed or other documents transferring title to the Real Property.

12.3 Records.

12.3.1 Washougal must maintain accounts and records that sufficiently and properly document its services and costs under this Agreement.

12.3.2 Upon reasonable notice, each Party may inspect and copy, without charge, all non-privileged records held by any other Party relating to this Agreement.

12.4 Notices. All notices required by this Agreement must be in writing by hand delivery, email, regular U.S. mail, or certified mail, return receipt requested.

If to Camas, notice must be sent to:

City Administrator
City of Camas
616 N.E. 4th Avenue
Camas, WA 98607

If to Washougal, notice must be sent to:

City Administrator
City of Washougal
1701 "C" Street
Washougal, WA 98671

Notice is considered given upon delivery or, if mailed, upon the earlier of actual receipt or three (3) business days after the date of mailing.

12.5 Indemnification. To the maximum extent permitted by law, Camas and Washougal indemnify and hold harmless the other Party and all of its officers, officials, employees, and volunteers from any and all claims, demands, injuries, losses, suits, actions, fines, penalties, and liability of any kind, including attorney fees, to the extent they arise out of or are related to the performance of this Agreement by the indemnifying Party or its officers, officials, employees, volunteers, agents, representatives, consultants, contractors, or subcontractors. This indemnity is not limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the indemnifying Party under workers' compensation acts, disability benefit acts, or other employee benefit acts. This indemnity is specifically and expressly intended to constitute a waiver of the indemnifying Party's immunity under Washington Industrial Insurance (Title 51 RCW) with respect to only the other Party, and only to the extent allowable by law and necessary to provide the indemnified Party with a full and complete indemnity of claims made by the indemnifying Party's employees. This waiver has been mutually negotiated. The provisions of this Subsection 12.5 survive the expiration or termination of this Agreement.

12.6 Non-Waiver. The failure on the part of any Party to enforce its right as to any provision of the Agreement shall not be construed as a waiver of its rights to enforce such provision in the future.

12.7 Force Majeure. If a Party is rendered unable by Force Majeure, to carry out, in whole or part, its obligations under this Agreement and such Party gives notice and full details of the event to the other Party as soon as practicable after such occurrence, the obligations of the Party affected by the event (other than the obligation to make payments due for performance prior to the event) shall be suspended to the extent required. Under this Agreement, "force majeure" shall mean acts of God, wars, strikes, lockouts, labor disputes, civil disorder, acts of terrorism, fires, floods, volcanic eruptions, earthquakes or other causes beyond the reasonable control of the affected Party.

terrorism, fires, floods, volcanic eruptions, earthquakes or other causes beyond the reasonable control of the affected Party.

12.8 Entire Agreement; Amendment. This Agreement contains the entire written agreement among the Parties and supersedes all prior discussions and agreements. This Agreement may be amended only in writing, signed by all Parties.

12.9 Termination of Existing Agreement. On the Effective Date, that 2006 Inter-Local Cooperation Agreement between the City of Camas and the City of Washougal (July 17, 2006) terminates. All cost and responsibility allocations with respect to the Steigerwald Water System are governed by this Agreement.

12.10 Authorship. This Agreement reflects the Parties' joint drafting efforts. In the event any dispute, disagreement, or controversy arises regarding this Agreement, the Parties will consider each other as joint authors and no provision may be interpreted against any Party because of authorship.

12.11 Successors and Assigns. All of the provisions contained in this Agreement are binding upon the successors and assigns of the Parties.

12.12 No Third Party Rights. This Agreement is solely for the benefit of the Parties and does not confer rights to any other individual or person.

12.13 No Joint Venture. This Agreement does not form any joint venture, partnership, administrative entity, or separate municipal corporation between the Parties. Washougal's officers, officials, employees, volunteers, agents, representatives, consultants, contractors, and subcontractors will not be deemed, and may not represent themselves as, employees of Camas.

12.14 Severability. If any section or part of this Agreement is held by a court of competent jurisdiction to be invalid or unenforceable, that action will not affect the validity or enforceability of any other section or part of this Agreement.

## 13. TERM AND TERMINATION

13.1 Effective Date. This agreement shall be effective upon last signature by the respective Parties hereto.

13.2 Term. The term of this Agreement is ten (10) years plus the remainder of the calendar year in which it becomes effective, ending on December 31, 2025. The term will automatically extend for two (2) consecutive terms of ten (10) years unless at least one Party gives the other Party notice of intent to terminate the Agreement on or before December 31 of the year prior to the year in which the Agreement will expire. Upon expiration of the second extension of ten (10) years, this Agreement will automatically extend for additional calendar-year terms until at least one Party gives the other Party notice of intent to terminate the Agreement on or before December 31 of the year prior to the year in which the Agreement will expire.

13.3 Termination. Either Party may terminate this Agreement for a default by the other Party if the defaulting Party has not cured the default or complied with the Order as provided in Agreement Section 8. Prior to termination, the Public Works Directors of the Parties will propose for approval by the governing bodies of each Party a plan to wind up the Project affairs, allocate assets of the Steigerwald Water System and administer the approved plan. Failure to agree on a plan is governed by Agreement Section 9.2. All applicable costs generated up to and including the date of termination shall be and remain the responsibility of the terminated Party to pay.

13.4 Withdrawal. Either Party may elect to withdraw from this Agreement as follows. The withdrawing Party shall provide at least five (5) years' advance written notice of its intent to withdraw. Such notice shall be delivered consistent with Section 14.4. The effective date of withdrawal shall be 11:59 PM on December 31 of the year following the five (5) years' notice is issued. Withdrawal has the same effect as termination and shall be governed by Agreement Sections and 9.2 and 13.3.

CITY OF CAMAS

By:_____
Mayor

Date: 9-8-2015

Attest: PETER CARLSON
Clerk

Approved as to form:

_____
City Attorney

CITY OF WASHOUGAL

By:_____
Mayor

Date: 8-24-2015

Attest:_____
Clerk

Approved as to form:

_____
City Attorney

EXHIBIT A:
REAL PROPERTY

A tract of land together with an easement for access and transmission main located in portions of Sections 17, 20 and 21, Township 1 North, Range 4 East, Willamette Meridian, Clark County, Washington; said tract is a portion of that particular parcel shown on the official record of survey recorded in Book 43 at Page 9, Records of Clark County, Washington, being more particularly described as follows:

Beginning at the Northwest corner of said Section 21 per said record of survey in Book 43 at Page 9;
Thence South 62°02'18" East a distance of 3,104 . 73 feet to the northerly right of way
line of the dike road as shown in said survey and the point of beginning of this description;
Thence along the following described courses:
North 10°34'45" East a distance of 461 . 58 feet;
South 88°36'01" East a distance of 347 . 39 feet;
South 68°07'52" East a distance of 343.29 feet;
South 73°19'26" East a distance of 198.86 feet;
South 73°26'56" East a distance of 160.51 feet;
North 17°28'45" East a distance of 102.65 feet;
South 67°16'49" East a distance of 31. 65 feet;
South 65°33'04" East a distance of 376.31 feet;
North 63°42 ' 19" East a distance of 112.43 feet;
South 01°23'59" West a distance of 292.78 feet to a point
here and after referred to as Point "A" said point also being located on the northerly dike road right of way line; Thence following along said northerly line the following described courses:
North 88°35'14" West a distance of 850.42 feet to the
beginning of a curve concave to the north having a radius
of 2,782.47 feet;
Thence northwesterly 113.96 feet along said curve through
a central angle of 2°20'10";
Thence North 86°15'03" West a distance of 141.48 feet;
Thence North 03°44'56" East a distance of 30.00 feet;
Thence North 86°15'03" West a distance of 516.09 feet to
the TRUE POINT OF BEGINNING.

Together with an easement beginning at said Point "A"; Thence
South a distance of 35.00 feet to the centerline of said dike road
and the beginning of this easement description; being 20
feet in width and lying 10 feet on each side of the following
described centerline: Following westerly and northwesterly on
and along the centerline of said dike road to a point due South
of said Northwest corner of Section 21; Thence North 38°03'10"
West leaving said dike road centerline a distance of 432 . 82
feet to a concrete monument with brass cap located in the
centerline of Index Street as shown on Record of Survey
recorded in Book 14 at Page 50, Records of Clark County,
Washington, and the terminus of this easement description.

# APPENDIX D – WUE MINUTES

# CITY COUNCIL WORKSHOP MEETING MINUTES
**Monday, October 7, 2019, 4:30 PM**
**City Hall, 616 NE 4th Ave**

## I. CALL TO ORDER

Mayor Shannon Turk called the meeting to order at 4:30 p.m.

## II. ROLL CALL

Present: Greg Anderson, Ellen Burton, Bonnie Carter, Don Chaney, Steve Hogan, Deanna Rusch and Melissa Smith

Staff: Sam Adams, Phil Bourquin, Pete Capell, James Carothers, Jennifer Gorsuch, Jim Hodges, Lauren Hollenbeck, Cathy Huber Nickerson, Mitch Lackey, Robert Maul, Heather Rowley, Madeline Sutherland, Nick Swinhart, Connie Urquhart and Steve Wall

Press: No one from the press was present

## III. PUBLIC COMMENTS

Denise Croucher, 2950 NW 38th Ave., Camas, commented about the proposed Community Aquatics Center.

Margaret Tweet, 2715 NW 34th Cir., Camas, commented about the proposed Community Aquatics Center.

Jeanne Mckirchy, 2833 NW Lacamas Dr., Camas, commented about the proposed Community Aquatics Center.

## IV. WORKSHOP TOPICS

A. Draft 2019 Water System Plan
Presenter: Sam Adams, Utilities Manager

Staff Report

Draft Water System Plan Presentation

Executive Summary

Chapter 6 - Water Use Efficiency

Public Notice

Adams reviewed the presentation and discussion ensued. Mayor Turk asked for public comment.

Margaret Tweet commented about fluoride and inquired about fluoride in Camas water. Adams responded.

This item will be placed on the October 21, 2019 Regular Meeting Agenda for Council's consideration.

B. NE Lake Road and NE Everett Street Roundabout Landscape Plan Update
Presenters: Steve Wall, Public Works Director and Robert Phipps, PBS Engineering and Environmental Inc.

Staff Report

Lake and Everett Landscape Presentation

October 3, 2019 Landscape Committee Presentation

Wall and Phipps reviewed the presentation. Discussion ensued. This item will be placed on a future agenda for further discussion.

C. Public Works Miscellaneous and Updates
Details: This is a placeholder for miscellaneous or emergent items.
Presenter: Steve Wall, Public Works Director

Wall provided an update regarding pavement preservation projects and a brief overview of the Well 17 Project on the Consent Agenda. He announced that a Regional Transportation Commission (RTC) Grant was awarded to the City and commented about the joint letter sent to the Environmental Protection Agency (EPA). Discussion ensued.

D. Camas Municipal Code (CMC) Proposed Amendments
Presenter: Robert Maul, Planning Manager

Staff Report

Draft Code Amendments

Maul provided an overview and responded to Council's questions. A public hearing will be placed on the October 21, 2019 Regular Meeting Agenda.

E. Community Development Miscellaneous and Updates
Details: This is a placeholder for miscellaneous or emergent items.
Presenter: Phil Bourquin, Community Development Director

Bourquin commented about sign codes and enforcement.

F. New Position Description and Salary Scale - Parking Enforcement Officer
Presenter: Jennifer Gorsuch, Administrative Services Director

Staff Report

Parking Enforcement Officer Position and Salary Scale

This item was also placed on the October 7, 2019 Regular Meeting Agenda for Council's consideration.

G. 2020 Property Tax Presentation
Presenter: Cathy Huber Nickerson, Finance Director

2020 Property Tax Presentation

Huber Nickerson reviewed the presentation. This item will be placed on a future agenda for Council's consideration.

H. 2020 Recommended Budget Presentation
Presenter: Cathy Huber Nickerson, Finance Director

2020 Recommended Budget Presentation

Huber Nickerson reviewed the presentation and discussion ensued. This item will be placed on a future agenda for Council's consideration.

I. City Administrator Miscellaneous Updates and Scheduling
Details: This is a placeholder for miscellaneous or scheduling items.
Presenter: Pete Capell, City Administrator

Capell reminded Council about the Association of Washington Cities (AWC) meeting on October 30, 2019, and the Ward 3 Meeting on October 8, 2019. He commented about questions he has received regarding the proposed Community Aquatics Center. Capell announced he will attend the Salary Commission meeting, the Georgia Pacific Advisory Committee (GPAC) meeting, and the Georgia Pacific Natural Gas Pipeline Safety Exercise. Capell also stated that the Priorities of Government Project will be placed on a November Council agenda for discussion.

## V. COUNCIL COMMENTS AND REPORTS

Hogan will attend the GPAC and the AWC meetings.

Anderson attended a tour of the Leadbetter house. He will attend the Ward 3 meeting and a meeting with East County Fire and Rescue (ECFR). He inquired about Lacamas Lake water quality testing. He commented about road improvements.

Carter attended meetings for the Public Works Committee and the Lake and Everett Landscape Committee. She also attended three ribbon cutting ceremonies.

Burton attended the Library Board of Trustees meeting and a ground breaking ceremony for the Vancouver Clinic. She spoke about a citizen's concern regarding vaping. She also commented about improving the City's communication.

Smith attended the Council for the Homeless fundraiser and a meeting of the Regional Transportation Committee. She will attend a C-TRAN meeting.

Chaney will attend the City/Schools meeting.

Mayor commented about the Camas Youth Advisory Council (CYAC) candidate forum, the All Paws On Deck Event dog mayor, and her visits by the second grade classes from Helen Baller and Dorothy Fox schools.

## VI. PUBLIC COMMENTS

Margaret Tweet, 2715 NW 34th Cir., Camas, commented about the proposed Community Aquatics Center.

## VII. ADJOURNMENT

The meeting adjourned at 6:20 p.m.

NOTE: The City welcomes public meeting citizen participation. For accommodations; call 360.834.6864.

# APPENDIX E – WATER QUALITY REPORTS

# ANNUAL WATER QUALITY REPORT

## 2015 Consumer Confidence Report

**HOW TO CONTACT US:**

**Water Department:**
360-817-1567

**City of Camas Website:**
www.cityofcamas.us

**City of Camas Backflow Hotline:**
360-817-1569

**Operations Center:**
360-817-1563

**Billing (Finance) Dept.**
616 NE Fourth Avenue
Camas, WA 98607
360-834-2462

**Emergency After Hours/ Holidays:** 360-737-0592

**Camas Connect 24/7:**
Stay Connected! Make service requests and follow the work flow. Download our new mobile app, or visit online:
www.cityofcamas.us/index.php/service-request

## Water Quality Results

At the City of Camas we understand how important it is to ensure the quality of the water we provide. The health of our consumers and their families is paramount and our goal is to provide you with a safe and dependable supply of drinking water. We work diligently to provide top quality water to a residential population of 21,210.

***Our drinking water is safe and surpasses all State and Federal health standards.***

We ask that all of our customers help us protect our water sources, which are the heart of our community, our way of life, and our children's future. This report provides a summary of the tests and processes performed to ensure the safety of your drinking water. For more information or questions about this report, please contact Mike Stevens at 360-817-7283.

Public Water System ID 108002

## Water Conservation

The average daily consumption of water for Camas in 2015 was 4.212 million gallons (mgd) per day. During our peak usage day on July 4th, 2015 we consumed 9.396 million gallons. Most of this increase in the summer months is due to irrigation demand. We are once again asking for your help to implement a voluntary odd/ even lawn watering program for residential customers. Water on odd days if your house number ends in an odd number, and even days if it ends in an even number.

*To view more water saving irrigation tips visit the following website:*
*www.ecy.wa.gov/programs/wr/ws/wtrcnsv.html*

***Although this report is of a technical nature, it is important information.***

**Attention Non-English Speaking Customers**

This report contains important information about your drinking water. Translate it or speak with someone who can translate it for you.

**Russian**
Это сообщение содержит важную информацию о вашей питьевой воде. Переведите это или говорите с кем - то, кто может перевести это для Вас.

**Spanish**
Este informe contiene información importante acerca de su agua potable. Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.

***Voluntary Odd/Even Watering Program***

***Water is a precious and limited resource. Use it wisely.***

## What's Ahead

Construction of the Camas Slow Sand Water Filtration Plant will wrap up this summer. Once complete, the new drinking water treatment facility will provide Camas with essential surface water sourced from Jones Creek and Boulder Creek.

Approximately 46% of the City's water meters have been replaced with advanced radio read meters. 1,200 more are scheduled for replacement in 2016.

# Important Health Information

Drinking water, including bottled water, may reasonably be expected to contain small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline 800-426-4791.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity.

**Contaminants that may be present in source water before we treat it include:**

- **Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.**
- **Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, and mining or farming.**
- **Pesticides and herbicides, which may come from a variety of sources such as agriculture and residential uses.**
- **Radioactive contaminants, which are naturally occurring.**
- **Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.**

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. We treat our water according to the EPA's regulations. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health. Some people may be more vulnerable to contaminants in drinking water than the general population.

Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

# EPA Statement for Lead and Copper

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking.

Copper is a mineral and natural component in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

If you are concerned about lead or copper in your water, you may wish to have your water tested. Information on lead and copper in your drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead

**To Reduce Exposure**

**1. When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.**

**2. Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.**

**3. Frequently clean the filter screens and aerators in faucets to remove captured particles.**

**4. If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.**

| Contaminants Inorganic | Maximum Contaminant Level Goal mg/L | Action Level (AL) mg/L | Camas Water Results g/L | Sample Year | # of Samples Exceeding AL | Violation | Typical Sources |
|---|---|---|---|---|---|---|---|
| Lead (ppb) at Consumers Tap | 0 | 0.015 | 0.0026 | 2015 | 0 of 30 | NO | Corrosion of household plumbing systems; erosion of natural deposits |
| Copper | 0 | 1.30 | 0.6100 | 2015 | 0 of 30 | NO | |

# Unregulated Contaminants Monitoring

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to help EPA determine their occurrence in drinking water and potential need for future regulation. For more information , go to:

*http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/ or contact the Safe Drinking Water Hotline at 1-800-426-4791, or at: http://water.epa.gov/drink/contact.cfm*

# 2015 Water Quality Test Results

The City of Camas has its water analyzed for more than 200 different regulated and unregulated contaminants. Only the samples that have detectable levels of contaminants are required by law to be reported to the public. The contaminants listed below are REGULATED and were in our water during 2015. All samples taken are from treated water that is delivered to the distribution system. All contaminants tested were below levels allowed by Federal and State agencies. We have provided definitions below to help you understand the terms and abbreviations that are used in the Test Results.

# Important Terms and Abbreviations

**Maximum Contaminant Level (MCL):** The "Maximum Allowed" is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

**Maximum Contaminant Level Goal (MCLG)** : The "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**Milligrams Per Liter (MG/L)**: a unit used in reporting the concentration of matter in water as determined by water analyses.

**Nephelometric Turbidity Unit (NTU)**: Nephelometric Turbidity Unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

**Picocuries Per Liter (pCi/L):** Picocuries per liter is a measure of the radioactivity in water.

**N/A** (Not applicable): Means EPA has not established MCLGs for these substances.

**Ug/L:** Units of measurement in micrograms/liter. A unit of concentration for dissolved substances based on their weights.

| Regulated Contaminants Unit Measurement | Violation | Range of Level Detected | Ideal Goal (MCLG) | MAX Allowed (MCL) | Description & Origin of Substance |
|---|---|---|---|---|---|
| **Health Related (Primary) Standards: Inorganic** | | | | | |
| Fluoride (MG/L) | No | 0.60-0.96 | 1 | 4 | Sodium fluoride added to Camas water to maintain good dental hygiene. |
| Nitrates (MG/L) (As Nitrogen) | No | 0.57-1.60 | 10 | 10 | Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products. |
| **Other Substances** | | | | | |
| Total Hardness (ppm) | No | 34 | N/A | N/A | Hardness units are in ppm as $CaCO^3$ (calcium carbonate equivalent units). |
| Turbidity (NTU) | No | 0.28 | N/A | N/A | Turbidity is a measure of the cloudiness of water. |
| **Disinfection By-Products and Residuals within the Distribution System** | | | | | |
| Haloacetic Acids (UG/L) | No | 9.60 | 48 | 60 | By-product of drinking water disinfection. |
| Total Trihalomethanes (UG/L) * | No | 4.10-15.00 | 60 | 80 | Chlorination by-product caused by the reaction of chlorine with organic matter. |
| **Unregulated Contaminants Monitoring Rule (UCMR 3)** | **Violation** | **Range of Level Detected** | **Ideal Goal (MCLG)** | **MAX Allowed (MCL)** | **Use or Environmental Source (further documented in UCMR 3 Contaminants-Information Compendium. EPA 815-B-11-001. January 2012)** |
| **Volatile Organic Compound Sampling: EPA Method 524.2** | | | | | |
| Chloromethane (UG/L) | No | 1.8 | N/A | N/A | Chloromethane, or Methylene Chloride, is predominantly used as a solvent. |
| Trans-1, 2-Dichloromethane (UG/L) | No | 0.52 | N/A | N/A | Trans-1, 2-Dichloromethane is used mainly as an intermediate in the synthesis of chlorinated solvents and compounds. |

Note: Routine coliform sampling yielded unsatisfactory results on July 21st, 2015 from NW Woodburn and NW Verbena. After retesting on July 22nd, 2015, all samples came back satisfactory with no detectable levels of coliform. It is assumed the sample method ws incorrect or the results were flawed. All Department of Health testing protocols were followed furing this testing.

*The sum of the concentration in micrograms per liter of the trihalomethane compounds (trichloromethane (chloroform), dibromochlormethane, bromodichloro-methane and tribromomethane (bromoform)), rounded to two significant figures.

As the City of Camas continues to grow, our water system serves a greater population each year. Along with updating and replacing old water mains in certain neighborhoods, there are a number of new developments starting. To accommodate the growth, the City is looking to install a water transmission line to the North Urban Growth Area (NUGA), update the comprehensive Water System Plan, and is in the design stage of a new reservoir to go in across from Prune Hill Elementary. For more information on projects and changes in the City, please visit us online at http://www.cityofcamas.us/, like us on Facebook at https://www.facebook.com/cityofcamas, and follow us on Twitter @CityofCamas.

# Our Water System

The City of Camas has multiple water sources that include surface and ground water. The surface water sources, Boulder and Jones Creeks, are located on the south side of Larch Mountain, northeast of Camas. Surface water was not used in 2015. However, once the new water treatment plant is constructed at the intersection of NE Lessard Road and NE Winters Road (anticipated in 2016), surface water will be seasonally provided to our customers. The ground water sources include nine wells near the Washougal river, and one well in Grass Valley. All water sources are treated with chlorine for disinfection, fluoride for good dental health, and sodium hydroxide to reduce the corrosion of copper piping to meet State and EPA standards. Water pressure and fire flows are maintained throughout the service area with seven distribution reservoirs, nine pump stations, and over 160 miles of pipeline.

# Water Leaks

Locate your master water supply valve and label it. The master supply valve can be turned off in case of a major leak or broken pipe.

The majority of leaks in residential plumbing systems are found at the toilet tank (fill and flapper valves).

Other common areas for leaks include:

- Lawn irrigation valves and lines
- Hose in yard turned on or leaking
- Ornamental fountains, fish ponds
- Relief valve or fittings on water heater
- Leaking pipes or fittings in the house
- Line between the meter and the house
- Dripping faucets in bathrooms or sinks
- Outside faucet open or dripping

The City is actively working to reduce system leaks. If you suspect a leak in your neighborhood please call 360-817-1563.

*Check out this helpful website at www.epa.gov/watersense/fixaleak*

City of Camas Numbers
Residential population served: 21,210
The Camas water system contains:
Seven reservoirs
Seven pump stations
8,175 water meters
Ten wells
More than 500 hydrants

## Five Simple Water Conservation Tips

1. Fix leaks inside and outside, including old leaky faucets, toilets, hoses, and sprinkler systems.
2. Choose water saving fixtures and appliances and you will use 30% less water.
3. Sweep porches, driveways and sidewalks rather than hosing, to not only conserve water, but to avoid runoff.
4. Water late at night or early in the morning (10:00 pm to 6:00 am).
5. Take a short shower instead of a bath.

***An inch of water per week is enough to keep lawns green.***

For more water saving ideas see our newsletters, news releases, and/or printed material available at City Hall and the Operations Center, or visit our website at www.cityofcamas.us or www.epa.gov/watersense

# It's Yearly Backflow Testing Time!

Make sure to schedule your yearly backflow inspection. If you are a property owner and have an in-ground sprinkler system you are required by State and local laws to install and maintain a backflow prevention device on your service line, and have it inspected yearly by a certified backflow tester. If you have more questions call our Backflow Cross Connection Hotline at 360-817-1569 For more information and a current list of certified backflow testers visit www.cityofcamas.us/index.php/pwwater#backflowirrigation

# Water Quality Monitoring

The City of Camas routinely monitors for constituents in your drinking water according to Federal and State laws. Field and laboratory analyses include tests for bacteria, as well as chemical and physical indicators. Reports are submitted monthly to the Department of Health to report that your water meets all drinking water standards. Should there ever be a public health concern, you would be notified immediately.

**Please report possible water pollution (illicit discharge) to the City of Camas 360-817-1567, or the Department of Ecology SW Regional Office 360-407-6300**

# ANNUAL WATER QUALITY REPORT

## 2016 Consumer Confidence Report

**HOW TO CONTACT US:**

**Water Department:**
360-817-1567

**City of Camas Website:**
www.cityofcamas.us

**City of Camas Backflow Hotline:**
360-817-1569

**Operations Center:**
360-817-1563

**Billing (Finance) Dept.**
616 NE Fourth Avenue
Camas, WA 98607
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**Emergency After Hours/ Holidays:** 360-737-0592

**Camas Connect 24/7:**
Stay Connected! Make service requests and follow the work flow. Download our new mobile app, or visit online:
www.cityofcamas.us/index.php/service-request

## Water Quality Results

At the City of Camas we understand how important it is to ensure we provide high quality water. The health of our consumers and their families is paramount and our goal is to provide you with a safe and dependable supply of drinking water. We work diligently to provide top quality water to a residential population of 21,810.

***Our drinking water is safe and surpasses all State and Federal health standards.***

We ask that all of our customers help us protect our water sources, which are the heart of our community, our way of life, and our children's future. This report provides a summary of the tests and processes performed to ensure the safety of your drinking water. For more information or questions about this report, please contact Rachel Jamison at 360-817-7267.

**Public Water System ID 108002**

## Water Conservation

The average daily water consumption in Camas for 2016 was 4.079 million gallons (mg/d) per day. During our peak usage day on August 19th, 2016 we consumed 8.509 million gallons. Most of this increase in the summer months is due to irrigation demand. We are once again asking for your help to implement a voluntary odd/even lawn watering program for residential customers. Water on odd days if your house number ends in an odd number, and even days if it ends in an even number.

*To view more water saving irrigation tips visit the following website:*
*www.ecy.wa.gov/programs/wr/ws/wtrcnsv.html*

***Although this report is of a technical nature, it is important information.***

**Attention Non-English Speaking Customers**

This report contains important information about your drinking water. Translate it or speak with someone who can translate it for you.

**Russian**
Это сообщение содержит важную информацию о вашей питьевой воде. Переведите это или говорите с кем - то, кто может перевести это для Вас.

**Spanish**
Este informe contiene información importante acerca de su agua potable. Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.

***Voluntary Odd/Even Watering Program***

***Water is a precious and limited resource. Use it wisely.***

## What's Ahead

The City of Camas Cross Connection Control Program is being updated. Be on the look out for increased information regarding backflow regulations and testing requirements.

Approximately 56% of the City's water meters have been replaced with advanced radio read meters. The City is continuing the replacement project and will be upgrading approximately 600 additional meters in 2017.

# Important Health Information

Drinking water, including bottled water, may reasonably be expected to contain small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline 800-426-4791.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity.

**Contaminants that may be present in source water before we treat it include:**

- **Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.**
- **Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, and mining or farming.**
- **Pesticides and herbicides, which may come from a variety of sources such as agriculture and residential uses.**
- **Radioactive contaminants, which are naturally occurring.**
- **Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.**

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. We treat our water according to the EPA's regulations. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health. Some people may be more vulnerable to contaminants in drinking water than the general population.

Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

# EPA Statement for Lead and Copper

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. The EPA requires the City to conduct lead testing every three years.

Copper is a mineral component naturally found in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

If you are concerned about lead or copper in your water, you may wish to have your water tested. Information on lead and copper in your drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead

**To Reduce Exposure**

**1. When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.**

**2. Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.**

**3. Frequently clean the filter screens and aerators in faucets to remove captured particles.**

**4. If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.**

| Contaminants Inorganic | Maximum Contaminant Level Goal mg/L | Action Level (AL) mg/L | Camas Water Results g/L | Sample Year | # of Samples Exceeding AL | Violation | Typical Sources |
|---|---|---|---|---|---|---|---|
| Lead (ppb) at Consumers Tap | 0 | 0.015 | 0.0026 | 2015 | 0 of 30 | NO | Corrosion of household plumbing systems; erosion of natural deposits |
| Copper | 0 | 1.30 | 0.6100 | 2015 | 0 of 30 | NO | |

# Unregulated Contaminants Monitoring

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to help EPA determine their occurrence in drinking water and potential need for future regulation. For more information, go to:

*http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/ or contact the Safe Drinking Water Hotline at 1-800-426-4791, or at: http://water.epa.gov/drink/contact.cfm*

# 2016 Water Quality Test Results

The City of Camas has its water analyzed for more than 200 different regulated and unregulated contaminants. Only the samples that have detectable levels of contaminants are required by law to be reported to the public. The contaminants listed below are REGULATED and were in our water during 2016. All samples taken are from treated water that is delivered to the distribution system. All contaminants tested were below levels allowed by Federal and State agencies. We have provided definitions below to help you understand the terms and abbreviations that are used in the Test Results.

## Important Terms and Abbreviations

**Maximum Contaminant Level (MCL):** The "Maximum Allowed" is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

**Maximum Contaminant Level Goal (MCLG)** : The "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**Milligrams Per Liter (MG/L)**: A unit of measurement used in reporting the concentration of matter in water as determined by water analyses.

**Nephelometric Turbidity Unit (NTU)**: Nephelometric Turbidity Unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

**Parts Per Million (ppm):** A unit of measurement used in reporting the concentration of matter in water as determined by water analyses.

**N/A** (Not applicable): Means EPA has not established MCLGs for these substances.

**Ug/L:** Units of measurement in micrograms/liter. A unit of concentration for dissolved substances based on their weights.

| Regulated Contaminants Unit Measurement | Violation | Range of Level Detected | Ideal Goal (MCLG) | MAX Allowed (MCL) | Description & Origin of Substance |
|---|---|---|---|---|---|
| **Health Related (Primary) Standards: Inorganic** | | | | | |
| Fluoride (MG/L) | No | 0.42-1.09 | 1 | 4 | Sodium fluoride added to Camas water to maintain good dental hygiene. |
| Nitrates (MG/L) (As Nitrogen) | No | 0.85-1.50 | 10 | 10 | Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products. |
| **Other Substances** | | | | | |
| Total Hardness (ppm) | No | 34 | N/A | N/A | Hardness units are in ppm as $CaCO^3$ (calcium carbonate equivalent units). |
| Turbidity (NTU) | No | 0.24 | N/A | N/A | Turbidity is a measure of the cloudiness of water. |
| **Disinfection By-Products and Residuals within the Distribution System** | | | | | |
| Haloacetic Acids (UG/L) | No | 4.20 | 48 | 60 | By-product of drinking water disinfection. |
| Total Trihalomethanes (UG/L) * | No | 5.20-11.00 | 60 | 80 | Chlorination by-product caused by the reaction of chlorine with organic matter. |
| **Unregulated Contaminants Monitoring Rule (UCMR 3)** | **Violation** | **Range of Level Detected** | **Ideal Goal (MCLG)** | **MAX Allowed (MCL)** | **Use or Environmental Source (further documented in UCMR 3 Contaminants-Information Compendium. EPA 815-B-11-001. January 2012)** |
| **Volatile Organic Compound Sampling: EPA Method 524.2** | | | | | |
| Chloromethane (UG/L) | No | Not Detected | N/A | N/A | Chloromethane, or Methylene Chloride, is predominantly used as a solvent. |
| Trans-1, 2-Dichloromethane (UG/L) | No | Not Detected | N/A | N/A | Trans-1, 2-Dichloromethane is used mainly as an intermediate in the synthesis of chlorinated solvents and compounds. |

*The sum of the concentration in micrograms per liter of the trihalomethane compounds (trichloromethane (chloroform), dibromochlormethane, bromodichloro-methane and tribromomethane (bromoform)), rounded to two significant figures.

As the City of Camas continues to grow, our water system serves a greater population each year. The City is currently seeking new water system supply to meet the needs of our growing population. You may hear about a new groundwater well called "Well 17", which the City is in the active planning stages. This includes finding a suitable location, testing for water availability and quality and seeking new water rights from the Department of Ecology. This process will take at least two years to complete but the City is committed to delivering clean and reliable drinking water to our citizens and meeting growing demands.

# Our Water System

The City of Camas has multiple water sources that include surface and ground water. The surface water sources, Boulder and Jones Creeks, are located on the south side of Larch Mountain, northeast of Camas. Surface water was not used in 2016. The ground water sources include nine wells near the Washougal river and one well in Grass Valley. All water sources are treated with chlorine for disinfection, fluoride for good dental health and sodium hydroxide to reduce the corrosion of copper piping to meet State and EPA standards. Water pressure and fire flows are maintained throughout the service area with seven distribution reservoirs, nine pump stations, and over 160 miles of pipeline.

# Water Leaks

Locate your master water supply valve and label it. The master supply valve can be turned off in case of a major leak or broken pipe.

The majority of leaks in residential plumbing systems are found at the toilet tank (fill and flapper valves).

Other common areas for leaks include:

- Lawn irrigation valves and lines
- Hose in yard turned on or leaking
- Ornamental fountains, fish ponds
- Relief valve or fittings on water heater
- Leaking pipes or fittings in the house
- Line between the meter and the house
- Dripping faucets in bathrooms or sinks
- Outside faucet open or dripping

The City is actively working to reduce system leaks. If you suspect a leak in your neighborhood please call 360-817-1563.

*Check out this helpful website at www.epa.gov/watersense/fixaleak*

City of Camas Numbers
Residential population served: 21,810
The Camas water system contains:
Seven reservoirs
Nine pump stations
8,421 water meters
Ten wells
More than 500 fire hydrants

## Five Simple Water Conservation Tips

1. Fix leaks inside and outside, including old leaky faucets, toilets, hoses, and sprinkler systems.
2. Choose water saving fixtures and appliances and you will use 30% less water.
3. Sweep porches, driveways and sidewalks rather than hosing, to not only conserve water, but to avoid runoff.
4. Water late at night or early in the morning (10:00 pm to 6:00 am).
5. Take a short shower instead of a bath.

***An inch of water per week is enough to keep lawns green.***

For more water saving ideas see our newsletters, news releases, and/or printed material available at City Hall and the Operations Center, or visit our website at www.cityofcamas.us or www.epa.gov/watersense

# It's Yearly Backflow Testing Time!

Make sure to schedule your yearly backflow inspection. If you are a property owner and have an in-ground sprinkler system you are required by State and local laws to install and maintain a backflow prevention device on your service line, and have it inspected yearly by a certified backflow tester. If you have more questions call our Backflow Cross Connection Hotline at 360-817-1569 For more information and a current list of certified backflow testers visit www.cityofcamas.us/index.php/pwwater#backflowirrigation

# Water Quality Monitoring

The City of Camas routinely monitors for constituents in your drinking water according to Federal and State laws. Field and laboratory analyses include tests for bacteria, as well as chemical and physical indicators. Reports are submitted monthly to the Department of Health to report that your water meets all drinking water standards. Should there ever be a public health concern, you would be notified immediately.

**Please report possible water pollution (illicit discharge) to the City of Camas 360-817-1567, or the Department of Ecology SW Regional Office 360-407-6300**

# ANNUAL WATER QUALITY REPORT

## 2017 Consumer Confidence Report

**CONTACT US:**

**Public Works**
**Water Department:**
360-817-1563

**Backflow Prevention:**
360-817-1569
**Email: backflow@cityofcamas.us**

**Water Billing**
616 NE Fourth Avenue
Camas, WA 98607
360-834-2462

**After Hours/Holiday**
**Water Emergency**
360-737-0592

**Camas Connect 24/7:**
Stay Connected! Make service requests and follow the work flow.

Download our new mobile app, or visit online:
www.cityofcamas.us/index.php/service-request

**City of Camas Website:**
www.cityofcamas.us

***Water is a precious and limited resource. Use it wisely.***

**Attention Non-English Speaking Customers**

This report contains important information about your drinking water. Translate it or speak with someone who can translate it for you.

**Russian**
Это сообщение содержит важную информацию о вашей питьевой воде. Переведите это или говорите с кем - то, кто может перевести это для Вас.

**Spanish**
Este informe contiene información importante acerca de su agua potable. Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.

## Water Quality Results

At the City of Camas we understand how important it is to ensure we provide high quality water. The health of our consumers and their families is paramount and our goal is to provide you with a safe and dependable supply of drinking water. We work diligently to provide top quality water to a residential population of 23,080.

*Our drinking water is safe and surpasses all State and Federal health standards.*

We ask that all of our customers help us protect our water sources, which are the heart of our community, our way of life, and our children's future. This report provides a summary of the tests and processes performed to ensure the safety of your drinking water. For more information or questions about this report, please contact Public Works call 360-817-1563, or email publicworks@cityofcamas.us

Public Water System ID 108002

## Water Conservation

The average daily water consumption in Camas for 2017 was 4.01 million gallons (mg/d) per day. During our peak usage day on July 22nd, 2017 we consumed 8.3 million gallons. Most of this increase in the summer months is due to irrigation demand. We are once again asking for your help to implement a voluntary odd/even lawn watering program for residential customers. Water on odd days if your house number ends in an odd number, and even days if it ends in an even number.

*To view more water saving tips for residential use visit the following websites: www.irrigationtutorials.com/faq/save-water.htm and www.home-water-works.org/water-conservation-tips/home*

***Voluntary Odd/Even Watering Program***

***Water Use Facts***

*A leaky faucet can waste 100 gallons a day.*

*An average bath requires 37 gallons of water.*

## What's Ahead

The City of Camas Cross Connection Control Program is being updated. Be on the look out for increased information regarding backflow regulations and testing requirements.

Approximately 65% of the City's water meters have been replaced with advanced radio read meters. The City is continuing the replacement project and will be upgrading approximately 600 additional meters in 2017.

# Important Health Information

Drinking water, including bottled water, may reasonably be expected to contain small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline 800-426-4791.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radio-active material. It can also pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water before we treat it include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, and mining or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture and residential uses.
- Radioactive contaminants, which are naturally occurring.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. We treat our water according to the EPA's regulations. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health. Some people may be more vulnerable to contaminants in drinking water than the general population.

Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.

# EPA Statement for Lead and Copper

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Camas is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. The EPA requires the City to conduct lead testing every three years.

Copper is a mineral component naturally found in solids. In the correct amounts, it is an essential nutrient for humans and plants. In Washington State, most copper in drinking water comes from corrosion of household plumbing. Plumbing sources can include copper pipe and brass fixtures. Copper from plumbing corrosion can accumulate overnight. Although copper is an essential mineral in the diet, too much copper can cause health problems. Copper is widely distributed within the tissues of the body, but accumulates primarily in the liver and kidneys. A single dose of 15 mg of copper can cause nausea, vomiting, diarrhea, and intestinal cramps.

If you are concerned about lead or copper in your water, you may wish to have your water tested. Information on lead and copper in your drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead

*To Reduce Lead and Copper Exposure*

*1. When your water has been sitting for several hours, flush the pipe by running the cold water tap until the water is noticeably colder before using the water for drinking or cooking.*

*2. Use only cold water for drinking, cooking, and making baby formula. Hot water may contain higher levels of copper.*

*3. Frequently clean the filter screens and aerators in faucets to remove captured particles.*

*4. If building or remodeling, only use "lead free" or low lead piping and materials. Avoid using copper piping or brass fixtures for locations where water will be consumed or used in food preparation.*

| Contaminants Inorganic | Maximum Contaminant Level Goal mg/L | Action Level (AL) mg/L | Camas Water Results g/L | Sample Year | # of Samples Exceeding AL | Violation | Typical Sources |
|---|---|---|---|---|---|---|---|
| Lead (ppb) at Consumers Tap | 0 | 0.015 | 0.0026 | 2015 | 0 of 30 | NO | Corrosion of household plumbing systems; erosion of natural deposits |
| Copper | 0 | 1.30 | 0.6100 | 2015 | 0 of 30 | NO | |

# Unregulated Contaminants Monitoring

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to help EPA determine their occurrence in drinking water and potential need for future regulation. For more information, go to:

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In some cases, certain contaminants are granted waivers from monitoring. This is due to past consecutive years of non-detectable results, or results lower that the State Reporting Level (SRL).

# Important Terms and Abbreviations

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pCi/L: Picocuries per liter is a unit for measuring radioactive concentrations. The curie (Ci) unit is the activity of 1 gram of pure radium.

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| Regulated Contaminants Unit Measurement | Violation | Range of Level Detected | Ideal Goal (MCLG) | MAX Allowed (MCL) | Description & Origin of Substance |
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| **Health Related (Primary) Standards: Inorganic** | | | | | |
| Fluoride (MG/L) | No | 0.31-1.13 | 1 | 4 | Sodium fluoride added to Camas water to maintain good dental hygiene. |
| Nitrates (MG/L) (As Nitrogen) | No | 1.30-1.60 | 10 | 10 | Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural products. |
| **Health Related Standards: Radiological** | | | | | |
| Radium 228 | No | .0366 -.313 | 0.00 | 5 pCi/L | Erosion of natural deposits leaching into the groundwater. |
| **Other Substances** | | | | | |
| Total Hardness (ppm) | No | 22 | N/A | N/A | Hardness units are in ppm as $CaCO^3$ (calcium carbonate equivalent units). |
| Turbidity (NTU) | No | 0.33 | N/A | N/A | Turbidity is a measure of the cloudiness of water. |
| **Disinfection By-Products and Residuals within the Distribution System** | | | | | |
| Haloacetic Acids (UG/L) | No | 6.9 | 48 | 60 | By-product of drinking water disinfection. |
| Total Trihalomethanes (UG/L) * | No | 4.50-10.00 | 60 | 80 | Chlorination by-product caused by the reaction of chlorine with organic matter. |

# New Water System Supply

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Please report possible water pollution (illicit discharge) to the City of Camas 360-817-1563, or the Department of Ecology SW Regional Office 360-407-6300

**Coliform Monitoring Plan for:** City of Camas

## A. System Information

**Plan Date:** April, 2019

| **Water System Name** | **County** | **System I.D. Number** |
|---|---|---|
| Camas | Clark | 108002 |
| **Name of Plan Preparer** | **Position** | **Daytime Phone** |
| Sam Adams | Utilities Manager | 360-817-1567 |
| **Sources:** DOH Source Number, Source Name, Well Depth, Pumping Capacity | (01) S06 - Well 5, 71 feet, 500 GPM<br>(02) S07- Well 6, 85 feet, 1450 GPM<br>(03) S08 - Well 7, 84 feet, 950GPM<br>(04) S09 - Well 8, 87 feet, 1350 GPM<br>(05) S11- Well 9, 253 feet, 650 GPM (Seasonal)<br>(06) S15 - Well 10, 92 feet, 900GPM<br>(07) S13 - Well 11, 106 feet, 1200 GPM<br>(08) S14 - Well 12, 106 feet, 900 GPM<br>(09) S16-Well 13,111 feet, 1325 GPM (Seasonal)<br>(10) S17 - Well 14, 90 feet, 1000 GPM<br>(11) S02 - Jones Creek, N/A, 450 GPM<br>(12) S01 - Boulder Creek, N/A, 1120 GPM<br>(both seasonal surface water sources) | |
| **Storage:** List and Describe | (1) Butler 1.2 MG Concrete<br>@ 26306 SE 15th Street<br>(2) Lower Prune Hill #1, 0.5 MG, Concrete<br>@ 600 NW 18th Loop<br>(3) Lower Prune Hill #2, 1.5MG, Concrete,<br>Same<br>(4) Upper Prune Hill #1 0.75 MG, Steel,<br>2822 NW 18th Avenue<br>(4) Upper Prune Hill #2, 2.4 MG, Steel,<br>Same<br>(6) Gregg, 0.10 MG, Steel,<br>1709 SE 270th Place,<br>(7) Lacamas, 2.0 MG, Steel, | |

| | |
|---|---|
| **Treatment:** Source Number & Process | **(1) Washougal Field** (Sodium Hydroxide Feed System25%, Hypochlorite 0.8% Feed System, Fluorosilicic 23% Feed System)<br>**(2) Well 13** (Sodium Hydroxide Feed System 25%, Hypochlorite 0.8% Feed System, Fluorosilicic 4% Feed System)<br>**(3) Well 14** (Sodium Hydroxide Feed System25%, Hypochlorite 0.8% Feed System, Fluorosilicic 23% Feed System)<br>**(4) Well 9** (Hypochlorite 5.25% Feed System, Fluorosilicic 4% Feed System)<br>**(5) SSWTP** (Sodium Hydroxide Feed System25%, Hypochlorite Feed System 0.8%, Fluorosilicic 23% Feed System, CO2 Injection) |
| **Pressure Zones:** Number and name | 68 Zones, See Appendix |
| **Population by Pressure Zone** | N/A |
| **Number of Routine Samples Required Monthly by Regulation:** | 30 |
| **Number of Sample Sites Needed to Represent the Distribution System:** | 35 |
| ***Request DOH Approval of Triggered Source Monitoring Plan?** | **Yes** ☒ **No** ☐ |

*If approval is requested a fee will be charged for the review.

## B. Laboratory Information

| | |
|---|---|
| **Laboratory Name**<br>BSK & Associates | **Office Phone 360-750-0055**<br>**After Hours Phone - -** |
| **Address**<br>2517 E Evergreen Blvd<br>Vancouver, WA 98661 | **Cell Phone - -**<br>**Email** dkarlsson@BSK.com |
| **Hours of Operation**<br>Monday-Friday, 9AM to 5PM | |
| **Contact Name**<br>Debra Karlsson | |
| **Emergency Laboratory Name**<br>BSK & Associates | **Office Phone - -**<br>**After Hours Phone 360-619-8248** |
| **Address**<br>SAME | |
| **Hours of Operation**<br>After-hours and weekends | |

| **Contact Name** |
|---|
| Elizabeth Bunger |

## C. Routine, Repeat, and Triggered Source Sample Locations*

| Location/Address for **Routine Sample Sites** | Location/Address for **Repeat Sample Sites** | Groundwater Sources for **Triggered Sample Sites**** |
|---|---|---|
| **LACAMAS RESERVIOR SERVICE AREA** | 1. **4302 NW Dahlia, meter box sample station**<br>Up – 2630 NW 44th HB<br>Down – 4069 Dahlia Loop - HB | **Washougal Well Field** |
| | 2. **Lacamas Booster Station, hose bib, inside, back wall**<br>Up – 1826 NE 45th - HB<br>Down – Heritage Park restroom | |
| | 3. **3263 NW 45th Court – Lacamas Pump Station – Sample Station Lacamas PRD**<br>Up – 3021 NW Grass Valley Dr.<br>Down –3324 NW 45th Ct | |
| | 4. **Fire Station #42 (Parker Street)**<br>Up – Grass Valley Park - HB<br>Down – Skyridge School - HB | |
| | 5. **West End 38th (Fischer) – Sample Station**<br>Up – 5225 NW 38th - HB front of House<br>Down – Fisher Investments Southside bldg. #3 - HB | |
| | 6. **Stone Leaf - NW 45th & NW Knight**<br>Up – 5802 NW 25th Ave<br>Down – 2611 NW Lorenz St | |
| | 7. **Parker Village - NW 20th**<br>UP – 4309 NW 20th – Hose bib on north side of building<br>DOWN – 1910 NW Brady Road – Hose bib | |
| | 8. **NW 42nd St & NW Utah St – Sample Tap** | |

| | | | |
|---|---|---|---|
| | | UP – 1910 NW 44th Ave – Hose bib<br>DOWN – 4105 NW Walden St – Hose bib | |
| **UPPER PRUNE HILL RESERVIOR SERVICE AREA** | 17. | **NW 24th & Elgin - Sample Station (on hydrant leg)**<br>UP – 2424 NW Elgin – Hose bib<br>DOWN – 636 NW 24th – Hose bib | |
| | 18. | **24th & Maryland Sample Station**<br>Up – 3555 NW 24th Cir<br>Down – 2427 NW Maryland hose bib on left side of house | |
| | 19. | **Lower Prune Hill Booster – Sample Tap**<br>Up – 1815 NW Fargo –HB<br>Down – 461 NW 17th – HB<br>Down – 440 NW 17th –HB | |
| | 20. | **Upper Prune Hill Booster – Sample Tap**<br>Up – LDS Church – hose bib on west side of step tank box<br>Down – 2612 NW 18th – hose bib on back of house | |
| | 21. | **NW 9th & Hoquiam Sample Station**<br>Up – 1034 Hoquiam<br>Down – 3323 NW 9th | |
| | 22. | **NW Goodwin LP Sample Station**<br>UP – 2424 NW Elgin – Hose bib<br>DOWN – 636 NW 24th – Hose bib | |
| | 23. | **Sacajawea Court & NW 9th**<br>Up – 750 NW Sacajawea St<br>Down – 4270 NW Sacajawea St | |

| | | | |
|---|---|---|---|
| | 8. | **Klickitat Circle**<br>UP – 1936 NW Klickitat St<br>DOWN – 2219 NW Klickitat Cir | |
| **GREGG RESERVIOR SERVICE AREA** | 9. | **27200 SE Robinson Rd – Sample Station**<br>Up – 27224 SE Robinson Rd – hose bib<br>Down – 27117 SE Robinson Rd – hose bib | |
| | 10. | **Gregg Booster – Sample Tap (old or new)**<br>Up – 945 NE 43rd – hose bib<br>Down – Butler Booster | |
| | 11. | **NE Woodburn Drive**<br>UP – 3544 NE Verbena Ct<br>DOWN – 1748 NE Pecan Ln | |
| | 12. | **3617 NE Sitka Drive**<br>UP – 3550 NE Sitka Drive<br>DOWN – 3626 NE Sitka Drive | |
| | 13. | **Crown Road Booster**<br>UP – Burnside Elementary School<br>DOWN – 420 NE Province | |
| **LOWER PRUNE HILL RESERVIOR SERVICE AREA** | 14. | **Forest Home Booster – Sample Station**<br>Up – Young's Deli – 419 NW 6th – wash sink<br>Down – 502 NW 7th – (Trucking Co.) – wash sink | |
| | 15. | **Angelo Booster Station – Sample Station**<br>Up – Lower PH booster – sample tap<br>Down – Wells – 13 or well field | |
| | 16. | **Crown Park – NE 17th & Dallas – Sample Station**<br>Up – Angelo Booster Station<br>Down – 531 NE 17th Ave | |

| | | | |
|---|---|---|---|
| | 24. | **SW 6th - West End**<br>Up – 2706 SW 6th Ave<br>Down – Dead End Hydrant | |
| | 25. | **Deerhaven (Leadbetter Rd & 45th)**<br>Up – Well Field – Hose bib inside pump room<br>Down – 1515 SE 8th Ave – Hose bib | |
| **BUTLER RESERVIOR SERVICE AREA** | 26. | **1707 NE Ione St – Old High School Bus Barn – wash sink in paint room**<br>Up – 1617 NE Ione Loop – hose bib<br>Down – 1608 NE Ione Loop – hose bib | |
| | 27. | **NE 2nd & Yale – Sample Station**<br>Up – 2815 E 1st – small sink in garage (take pliers for screen)<br>Down – 2803 NE 2nd – hose bib | |
| | 28. | **Butler Booster – Sample tap**<br>Up – Gregg Booster (old or new)<br>Down – 535 NE 43rd – hose bib at garage on the corner of Garfield & 43rd | |
| | 29. | **SE 11th & Polk – Sample Station**<br>Up – STP – lab room – north sink<br>Down – 1718 SE 11th (The River Place Apts) – hose bib by garbage bins | |
| | 30. | **Deerhaven (Leadbetter Rd & 45th)**<br>UP – 122 N 45th Circle<br>DOWN – 4733 N Adams | |
| | 31. | **NW 92nd & Ingle Rd**<br>UP – 7411 NW 92nd Ave | |

| | | |
|---|---|---|
| | DOWN – Heritage Trail<br>Bathroom – outside - HB | |

*NOTE: If you need more than three routine samples to cover the distribution system, attach additional sheets as needed.

**** When you collect the repeats, you must sample every groundwater source that was in use when the original routine sample was collected.**

## Important Notes for Sample Collector: ____See I. Emergency Notifications

_____

_____

_____

_____

_____

_____

**D. Reduced Triggered Source Monitoring Justification (add sheets as needed):**

| |
|---|
| |

**E. Routine Sample Rotation Schedule (All Sample Sites Rotated Monthly)**

| Month | Routine Site(s) | Month | Routine Site(s) |
|---|---|---|---|
| January | | July | |
| February | | August | |
| March | | September | |
| April | | October | |
| May | | November | |
| June | | December | |

**F. Level 1 and Level 2 Assessment Contact Information**

| | |
|---|---|
| **Name**<br>**Allen Nelson - Primary** | **Office Phone 360-817-7287**<br>**After Hours Phone 360-772-6329** |
| **Address**<br>**1620 SE 8th Ave**<br>**Camas, WA 98607** | **Email anelson@cityofcamas.us** |
| **Name**<br>**Brandonn Prather** | **Office Phone 360-817-1567**<br>**After Hours Phone 360-927-2873** |
| **Address**<br>**1620 SE 8th Ave**<br>**Camas, WA 98607** | **Email bprather@cityofcamas.us** |

## G. *E. coli*-Present Sample Response

| Distribution System *E. coli* Response Checklist | | | | |
|---|---|---|---|---|
| **Background Information** | **Yes** | **No** | **N/A** | **To Do List** |
| We inform staff members about activities within the distribution system that could affect water quality. | ☒ | ☐ | ☐ | ☐ |
| We document all water main breaks, construction & repair activities, and low pressure and outage incidents. | ☐ | ☒ | ☐ | ☒ |
| We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents. | ☒ | ☐ | ☐ | ☐ |
| Our Cross-Connection Control Program is up-to-date. | ☒ | ☐ | ☐ | ☐ |
| We test all cross-connection control devices annually as required, with easy access to the proper documentation. | ☒ | ☐ | ☐ | ☐ |
| We routinely inspect all treatment facilities for proper operation. | ☒ | ☐ | ☐ | ☐ |
| We identified one or more qualified individuals who are able to conduct a Level 2 assessment of our water system. | ☒ | ☐ | ☐ | ☐ |
| We have procedures in place for disinfecting and flushing the water system if it becomes necessary. | ☒ | ☐ | ☐ | ☐ |
| We can activate an emergency intertie with an adjacent water system in an emergency. | ☐ | ☒ | ☐ | ☐ |
| We have a map of our service area boundaries. | ☒ | ☐ | ☐ | ☐ |
| We have consumers who may not have access to bottled or boiled water. | ☐ | ☒ | ☐ | ☐ |
| There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water. | ☐ | ☒ | ☐ | ☐ |
| We have identified the contact person at each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory. | ☐ | ☒ | ☐ | ☒ |
| We have messages prepared and translated into different languages to ensure our consumers will understand them. | ☐ | ☒ | ☐ | ☒ |
| We have the capacity to print and distribute the required number of notices in a short time period. | ☒ | ☐ | ☐ | ☐ |
| **Policy Direction** | **Yes** | **No** | **N/A** | **To Do List** |
| We have discussed the issue of *E. coli*-present sample results with our policy makers. | ☐ | ☒ | ☐ | ☒ |
| If we find *E. coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers. | ☒ | ☐ | ☐ | ☐ |
| **(Cont.)** | | | | |

| Distribution System *E. coli* Response Checklist | | | | |
|---|---|---|---|---|
| **Potential Public Notice Delivery Methods** | **Yes** | **No** | **N/A** | **To Do List** |
| It is feasible to deliver a notice going door-to-door. | ☐ | ☒ | ☐ | ☐ |
| We have a list of all of our customers' addresses. | ☒ | ☐ | ☐ | ☐ |
| We have a list of customer telephone numbers or access to a Reverse 9-1-1 system. | ☒ | ☐ | ☐ | ☐ |
| We have a list of customer email addresses. | ☐ | ☒ | ☐ | ☐ |
| We encourage our customers to remain in contact with us using social media. | ☒ | ☐ | ☐ | ☐ |
| We have an active website we can quickly update to include important messages. | ☒ | ☐ | ☐ | ☐ |
| Our customers drive by a single location where we could post an advisory and expect everyone to see it. | ☐ | ☒ | ☐ | ☐ |
| We need a news release to supplement our public notification process. | ☒ | ☐ | ☐ | ☐ |

## Distribution System *E. coli* Response Plan

**If we have *E. coli* in our distribution system, we will immediately:**

1. Call DOH.
2. Collect repeat and triggered source samples per Part D. Collect additional investigative samples as necessary.
3. Contact Public Works Director/ Public Officials
4. Immediately begin investigation of trigger source
5. Isolate trigger source
6. Reroute directional flow to bypass trigger source
7. Discuss with DOH whether to issue a Health Advisory based on the findings of steps 3-6.

| *E. coli*-Present Triggered Source Sample Response Checklist – All Sources | | | | |
|---|---|---|---|---|
| **Background Information** | **Yes** | **No** | **N/A** | **To Do List** |
| We review our sanitary survey results and respond to any recommendations affecting the microbial quality of our water supply. | ☒ | ☐ | ☐ | ☐ |
| We address any significant deficiencies identified during a sanitary survey. | ☒ | ☐ | ☐ | ☐ |
| There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and<br>If yes, we can eliminate them. | ☐<br>☐ | ☒<br>☐ | ☐<br>☐ | ☐<br>☐ |
| We routinely inspect our well site(s). | ☒ | ☐ | ☐ | ☐ |
| We have a good raw water sample tap installed at each source. | ☒ | ☐ | ☐ | ☐ |
| After we complete work on a source, we disinfect the source, flush, and collect an investigative sample. | ☒ | ☐ | ☐ | ☐ |
| **Public Notice** | **Yes** | **No** | **N/A** | **To Do List** |
| We discussed the requirement for immediate public notice of an *E. coli*-present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan. | ☐ | ☒ | ☐ | ☒ |
| We discussed the requirement for immediate public notice of an *E. coli*-present source sample result with our wholesale customers and encouraged them to develop a response plan. | ☐ | ☐ | ☒ | ☐ |
| We have prepared templates and a communications plan that will help us quickly distribute our messages. | ☐ | ☒ | ☐ | ☐ |

| *E. coli*-Present Triggered Source Sample Response Checklist – Source S__* | | | | |
|---|---|---|---|---|
| **Alternate Sources** | **Yes** | **No** | **N/A** | **To Do List** |
| We can stop using this source and still provide reliable water service to our customers. | ☒ | ☐ | ☐ | ☐ |
| We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months). | ☐ | ☒ | ☐ | ☐ |
| We can provide bottled water to all or part of the distribution system for an indefinite period. | ☐ | ☐ | ☒ | ☐ |
| We can quickly replace our existing source of supply with a more protected new source. | ☒ | ☐ | ☐ | ☐ |
| **Temporary Treatment** | **Yes** | **No** | **N/A** | **To Do List** |
| This source is continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer.<br>If yes, at what concentration? _____ mg/L | ☒ | ☐ | ☐ | ☐ |
| We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large portion of the distribution system. | ☒ | ☐ | ☐ | ☐ |
| We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6. | ☒ | ☐ | ☐ | ☐ |
| We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine. | ☒ | ☐ | ☐ | ☐ |

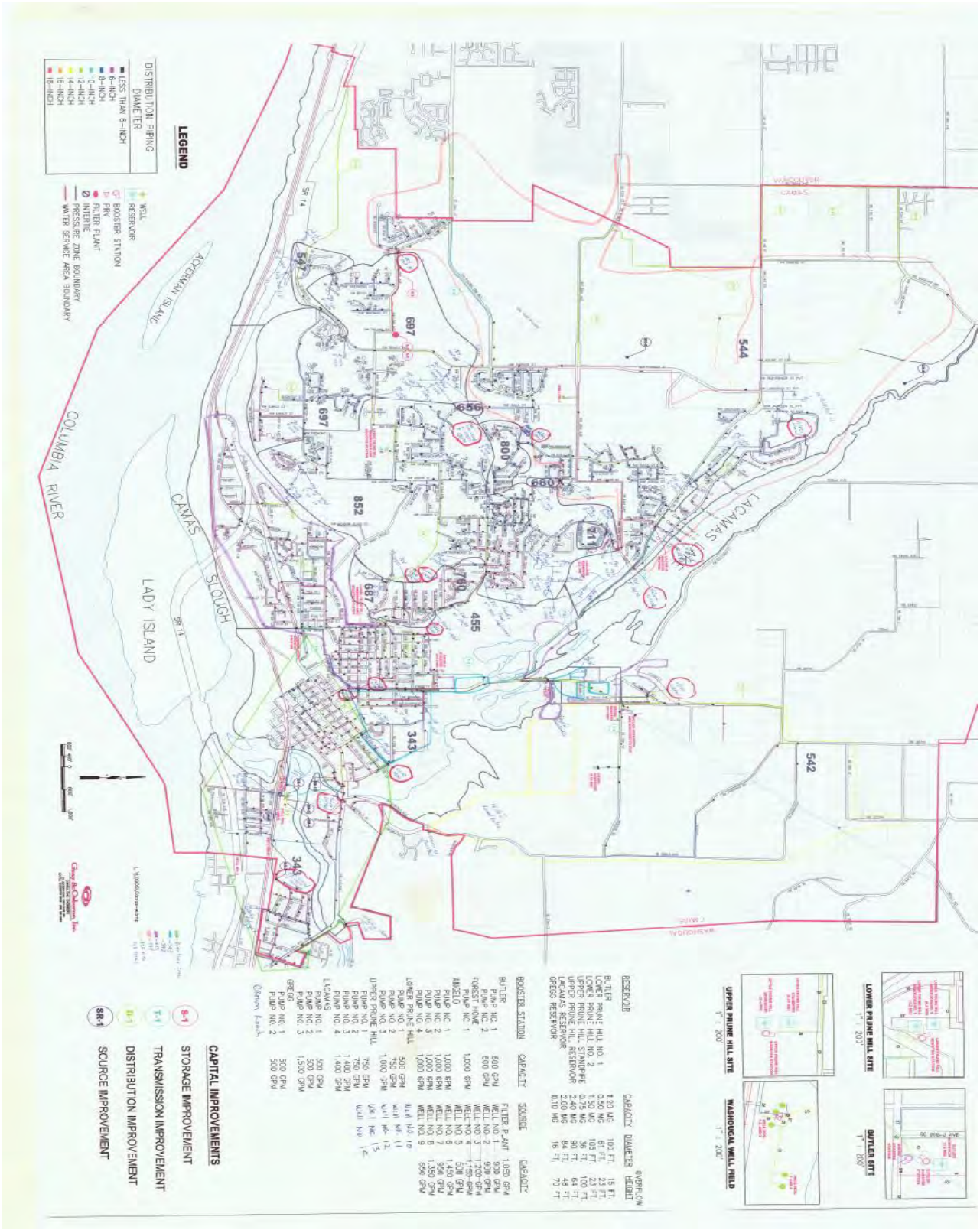
*NOTE: If your system has multiple sources, you may want to complete a separate checklist for each source.

## *E. coli*-Present Triggered Source Sample Response Plan – Source ___

**If we have *E. coli* in Source ___ water we will immediately:**

1. Call DOH.
2. Begin immediate investigation of trigger source
3. Isolate trigger source
4. Reroute directional flow to bypass trigger source
5. Contact Public Works Director and Elected Officials

## H. System Map




## I. Emergency Notification List

The list on the following pages shall be used as needed to contact businesses that may be impacted by a water outage or contamination incident.

## Medical Facilities

**Camas Hearing Clinic**
605 NE 5th Ave. Camas, WA 98607
360-833-0609

**Community Pregnancy Clinic of Camas-Washougal**
1542 NE 3rd Ave. Camas, WA 98607
360-834-2829

**Camas Vision Centre**
225 NE 4th Ave. Camas, WA 98607
360-834-2063

**Vancouver Vision Clinic**
405 NE 6th Ave. Camas, WA 98607
360-834-4802

**Lacamas Medical Group PC**
3240 NE 3rd Ave. Camas, WA 98607
360-838-2440

**Adventist Health/Medical Clinics**
411 NE 6th Ave. Camas, WA 98607
360-834-2863

**Supplement Clinic**
30201 NE Stauffer Rd. Camas, WA 98607
360-210-7117

**Blossom Natural Health & Wellness**
417 NE Birch St. Camas, WA 98607
360-834-2732

**Allen, Trevor W DMD PC**
736 NE 6th Ave. Camas, WA 98607
360-859-9115

**Design Dentistry**
531 NE Everett St. Camas, WA 98607
360-834-4990

**Harris, Bryan D DDS**
316 NE Cedar St. Camas, WA 98607
360-834-2682

**Nevin, Robert B Dntst**
403 NE 6th Ave. Camas, WA 98607
360-834-2182 (B) / 360-834-7653 (H)

**Nevin, H. R. DDS JR**
1636 NE Ione Loop, Camas, WA 98607
360-834-3546

**Riverside Dental**
2016 NE 3rd Ave. Camas, WA 98607
360-834-3963

## Restaurants

**Roundtable**
3136 Ne 3rd Ave. Camas, WA 98607
360-210-4534

**Don Pedro**
3545 NE 3rd Ave. Camas, WA 98607
360-210-5993

**Kop Chai**
325 NE Cedar St. Camas, WA 98607
360-834-3289

**Burgerville, #24**
518 NE 3rd Ave. Camas, WA 98607
360-834-3289

**Papa Murphy's Take 'N' Bake Pizza**
2406 SE 8th Ave. Camas, WA 98607
360-834-6907

**Domino's Pizza**
3512 NE 3rd Ave. Camas, WA 98607
360-835-1500

**Subway Restaurant**
602 NE 3rd Ave, Suite B. Camas, WA 98607
360-834-0210

**K&M Drive-in**
3414 NE 3rd Ave. Camas, WA 98607
360-210-5803

**Mill Corner**
204 NE 4th Ave. Camas, WA 98607
360-833-0474

**Smittys**
1816 Ne 3rd Ave. Camas, WA 98607
360-834-4257

**Camas Thai Cuisine**

308 NE 5th Ave. Camas, WA 98607
360-833-1175

**Taco Bell**
3405 NE 3rd Ave. Camas, WA 98607
360-835-9201

**Top Burger Restaurant**
1436 NE Everett St. Camas, WA 98607
360-834-3867

**Lakeside Chalet → recently purchased, new name pending**
3533 Ne Everett St. Camas, WA 98607
TBD

**El Rancho Viejo**
231 Ne 3rd Ave. Camas, WA 98607
360-834-5856

**Rice Time**
412 Ne 4th Ave. Camas, WA 98607
360-833-9111

**McDonald's**
3354 NE 3rd Ave. Camas, WA 98607
360-835-8958

**Piccolo Paradiso**
309 Ne Birch St. Camas, WA 98607
360-834-7044

**Natalias Café**
437 NE 4th Ave. Camas, WA 98607
360-844-5968

## Elder Care Facilities

**Mountainview House**
2647 NW Kent St. Camas, WA 98607
360-834-3988

**Prune Hill Adult Family Home**
2247 NW Cascade St. Camas, WA 98607
360-834-5556

**Heart-Two-Heart Care LLC**
1745 Division St. Camas, WA 98607
360-210-7883

**Lacamas Adult Family Home LLC**
2746 NE 20th Ave. Camas, WA 98607
360-210-5761

**Assisted Living Concepts**
2647 NW Kent St. Camas, WA 98607
360-834-3988

**Highland Terrace Nursing Center**
640 Ne Everett St. Camas, WA 98607
360-834-5055

## Child Care Facilities

**Camas School District 117 – School Districts, Camas Childcare**
1919 NE Ione St. Camas, WA 98607
360-817-4400

**Parkside Christian Preschool and Day Care**
1243 E 1st Ave. Camas, WA 98607
360-834-4002

# WATER SYSTEM EMERGENCY RESPONSE PLAN

## FEDERAL AND STATE REQUIREMENTS

### FEDERAL REQUIREMENTS

Under the Public Health Security and Bioterrorism Preparedness and Response Act (Bioterrorism Act), Public Law 107-122 of June 12, 2002, drinking water systems serving more than 3,300 but less than 50,000 customers must complete a vulnerability assessment by June 30, 2004 and an emergency response plan (ERP) by December 30, 2004.

The U.S. Environmental Protection Agency (EPA) considers completion to mean the date on which the vulnerability assessment and certification were sent to EPA. The City submitted its vulnerability assessment on June 30, 2004, and the City completed its ERP certification by December 30, 2004.

The Bioterrorism Act requires the ERP to incorporate the results of the vulnerability assessment and include the following:

- Plans, procedures and equipment that can be implemented or utilized in the event of a terrorist or other intentional attack on the public water system.

- Actions, procedures and identification of equipment that can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals.

### STATE REQUIREMENTS

The operations and maintenance section of Chapter 246-290-415 (2)(b) WAC requires public water systems in Washington to have an emergency response plan as part of a water system plan. It also requires that systems employ reasonable security measures to protect the raw water intake facilities, water treatment processes, storage facilities, pump houses, and distribution systems from possible damage or intruders. The State requirements for emergency response must address all applicable hazards that could lead to abnormal operating conditions, such as flood, fire, unscheduled power outages, facility failure and system maintenance.

**WATER SYSTEM EMERGENCY RESPONSE PLAN OUTLINE**

Both the EPA and Washington State Department of Health (DOH) have prepared guides to develop emergency response plans that will comply with the Bioterrorism Act.

- *Emergency Response Guidance for Small and Medium Community Water Systems to Comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002*, EPA 816-R-04-002, April 2004.

- *Emergency Response Planning Guide for Public Drinking Water Systems*, DOH Publication 331-211, May 2003.

The City's water system emergency response plan is based primarily upon the EPA guidance document, which establishes eight basic elements for an ERP:

1. System Specific Information
2. Community Water System Roles and Responsibilities
3. Water System Communication Procedures
4. Personal Safety
5. Identification of Alternative Water Sources
6. Replacement of Equipment and Chemicals
7. Property Protection
8. Water Sampling and Monitoring

The DOH planning guidance has been utilized to develop the eight elements of this ERP. Whenever possible, terminology used by the Department of Homeland Security and its sub-agency, the Federal Emergency Management Agency (FEMA) as well as the Occupational Safety and Health Administration (OSHA) and the National Fire Protection Association (NFPA) has been used relative to emergency management principles, hazardous materials response, mass casualty response and emergency medical response.

The following documents from EPA Water Security website were a technical resource for this ERP as well:

(Reference: http://cfpub.epa.gov/safewater/watersecurity/index.cfm )

*Planning for and Responding to Drinking Water Contamination Threats and Incidents Response Protocol Toolbox* (December 2003)

- Overview and Application
- Module 1: Water Utility Planning Guide
- Module 2: Contamination Threat Management Guide
- Module 3: Site Characterization and Sampling Guide
- Module 4: Analytical Guide

- Module 5: Public Health Response Guide
- Module 6: Remediation and Recovery Guide

## EMERGENCY PLANNING AND OPERATION PRECEPTS

To be effective in a resource-constrained environment where multiple response agencies are involved, emergency planning for a water system must be considered in the context of the community's overall planning for emergency operations. The following sections identify and discuss the various plans that the City utilizes in its "all hazards" emergency management program.

### CITY OF CAMAS DISASTER MANUAL

The City's Disaster Manual identifies the Emergency Response functions within the City based on a modified Incident Command System. The City Fire Chief is designated as the Incident Commander. The five functions coordinated by the incident commander are as follows:

- Police
- Public Information Officer
- Resource Officer (includes Public Works)
- Communications
- Disaster Control Officer

### Emergency Operations Center (EOC)

The EOC is located at the City Police Department Headquarters building and provides overall direction, control and coordination of an incident. The EOC is primarily concerned with resource management and coordination between City Departments and other County/Regional, State and Federal emergency response and management agencies.

### On-Scene Emergency Management

On scene management of emergencies is the responsibility of the Disaster Control Officer, who has a number of functions to coordinate, including:

- Suppression (includes rescue and control)
- Safety
- Triage

The City does not have its own hazardous materials response capability. This response capability is available from the City of Vancouver and the Georgia Pacific paper mill

through a coordinated response plan that was development by the County Regional Emergency Services Agency.

## CLARK COUNTY REGIONAL EMERGENCY SERVICES AGENCY (CRESA)

The City utilizes the Clark County Regional Emergency Services Agency (CRESA) as its emergency management agency. CRESA also serves as the Local Emergency Planning Authority under the Superfund Amendments and Reauthorization Act (SARA) Title III (also known as the Emergency Planning and Community Right to Know Act – EPCRA) for communities in Clark County, including the City of Camas, the City of Washougal and the City of Vancouver. The CRESA website is:

http://www.cresa911.org/

## RELATED COUNTY AND REGIONAL PLANS

In the event local capabilities to manage an incident are exceeded, the City will utilize mutual aid partners through the following plans and guidance documents:

- Clark County Regional Hazardous Materials Response Plan
- Washington State Department of Transportation Public Works Emergency Response Mutual Aid Agreement
- Interlocal Agreement between the City of Camas and the City of Washougal for Equipment Acquisition
- Reimbursable Services Agreement between Clark County Department of Public Works and the City of Camas

## HAZARD IDENTIFICATION AND VULNERABILITY ANALYSIS

The City of Camas utilizes the Clark County Hazard Identification and Vulnerability Analysis as the primary means for identifying hazards and vulnerabilities. The Clark County HIVA was last updated in 2003.

To comply with the Bioterrorism Act, the City completed a water system vulnerability assessment (WSVA) in June 2004. The results of the WSVA are considered confidential and will not be addressed as to their specific finding and recommendations in the ERP. However, the ERP must incorporate the WSVA results in terms of providing response plans that address the general categories of vulnerabilities identified in the WSVA.

Table 5-1 summarizes all hazards identified in the County HIVA and the City's WSVA that have been considered in the development of the City's ERP; the final column

identifies those hazards considered significant enough to address in the City's water system ERP. Clark County has assigned probability, vulnerability and risk levels to each hazard. Each of these parameters is discussed in greater detail below.

**Probability**

An adjective description (High, Moderate, or Low) of the probability of a hazard impacting Clark County within the next 25 years is assigned to each hazard. Probability is based on an assessment of a hazard's frequency using information provided by relevant sources, observations and trends.

- HIGH: There is great likelihood that a hazardous event will occur within the next 25 years.

- MODERATE: There is moderate likelihood that a hazardous event will occur within the next 25 years.

- LOW: There is little likelihood that a hazardous event will occur within the next 25 years.

**Vulnerability**

An adjective description (High, Moderate, or Low) of the potential impact a hazard could have on Clark County is assigned to each hazard. It is the ratio of population, property, commerce, infrastructure and services at risk relative to the entire County.

- HIGH: The total population, property, commerce, infrastructure and services of the county are uniformly exposed to the effects of a hazard of potentially great magnitude. In a worst case scenario there could be a disaster of major to catastrophic proportions.

- MODERATE**:** The total population, property, commerce, infrastructure and services of the county are exposed to the effects of a hazard of moderate influence;

  or

  The total population, property, commerce, infrastructure, and services of the county are exposed to the effects of a hazard, but not all to the same degree;

  or

An important segment of population, property, commerce, infrastructure, or service is exposed to the effects of a hazard. In a worse case scenario there could be a disaster of moderate to major, though not catastrophic proportions.

- LOW: A limited area or segment of population, property, commerce, infrastructure, or service is exposed to the effects of a hazard. In a worse case scenario there could be a disaster of minor or moderate proportions.

**Risk Rating**

An adjective description (High, Moderate, or Low) of the overall threat posed by a hazard over the next 25 years. It is a subjective estimate of the combination of probability of occurrence and vulnerability.

- HIGH: There is strong potential for a disaster of major proportions during the next 25 years;

  or

  History suggests the occurrence of multiple disasters of moderate proportions during the next 25 years. The threat is significant enough to warrant major program effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be a major focus of the emergency management training and exercise program.

- MODERATE: There is moderate potential for a disaster of less than major proportions during the next 25 years. The threat is great enough to warrant modest effort to prepare for, respond to, recover from, and mitigate against hazard. This hazard should be included in an emergency management training and exercise program.

- LOW: There is little potential for a disaster during the next 25 years. The threat is such as to warrant no special effort to prepare for, respond to, recover from, or mitigate against this hazard. This hazard need not be specifically addressed in the county's emergency management training and exercise program except as generally dealt with during hazard awareness training.

**TABLE 5-1**

**Hazard Identification and Vulnerability Assessment Summary City of Camas**

| Hazard Classification | Hazard | Probability | Vulnerability | Risk | Applies to City of Camas Water System |
|---|---|---|---|---|---|
| Drinking Water Unique | Bacteriological Contamination | MODERATE | MODERATE | MODERATE | X |
| Natural Disaster | Drought | HIGH | MODERATE | MODERATE | X |
| | Earthquake | HIGH | HIGH | HIGH | X |
| | Flood | HIGH | MODERATE | HIGH | X |
| | Forest/Wildland Fire | MODERATE | MODERATE | MODERATE | X |
| | Landslide | HIGH | LOW | MODERATE | X |
| | Severe Local Storm | HIGH | HIGH | HIGH | X |
| | Tornado | HIGH | LOW | LOW | X |
| | Volcano | LOW | MODERATE | LOW | X |
| Technological Hazards | Airplane Crash | MODERATE | LOW | MODERATE | X |
| | Dam Failure | LOW | LOW | LOW | X |
| | Hazardous Materials | HIGH | MODERATE | HIGH | X |
| | Energy Emergency | MODERATE | MODERATE | MODERATE | X |
| | Transportation Accident | MODERATE | LOW | MODERATE | X |
| | Urban Fire | MODERATE | MODERATE | MODERATE | X |
| Criminal Activity | Terrorist Use of Chemical, Biological, Radiological, Nuclear Agents and Explosives | LOW | MODERATE | MODERATE | X |
| | Cyber Attack | LOW | MODERATE | MODERATE | X |
| | Vandalism | LOW | MODERATE | MODERATE | X |

### SYSTEM SPECIFIC INFORMATION

Chapter 3 of this manual provides a complete description of the City's water system facilities.

### Interties

The City currently has an emergency intertie agreement with the City of Washougal to the east. The City has two one-way PRV interties with Washougal, located on SE Shepherd Street and at the intersection of SE 3rd Street and Whitney Street. These interties provide water from the City of Camas to the City of Washougal under low pressure conditions. The City also has an intertie agreement with the City of Vancouver located east of SE 192nd Ave just north of Brady Road in the Columbia Palisades development.

### Telemetry and Control System

The City's telemetry system monitors levels in the storage facilities and the status of the booster pump stations and groundwater wells. Installed in 1988 and continually upgraded, the system allows the City to record various systems such as pump runs, reservoir drain and fill and other metering information. The system also has the capability of reading instantaneous flow from individual pumps. The system allows the City to monitor and control the operation of these facilities from the office and over the Internet from home. The chemical feed system for the Washougal wellfield and can be remotely monitored in its operations in the same manner as the wells, reservoirs and booster stations.

### Supervisory Control and Data Acquisition (SCADA) System

The City has a SCADA system with master control located at the City Operations Center. The system uses programmable control software, which can be controlled by a personal computer at the operations center or remotely by a modem connected to a remote computer. The system monitors reservoir levels, well status, well flow rate, booster pump flow rate when metered, pump status, run time and alarm conditions. Reservoir levels are recorded on circular charts on a continual basis. The City also has the ability to monitor the drawdown level in the aquifer at Washougal Well field.

## WATER SYSTEM ROLES AND RESPONSIBILITIES

### PUBLIC WORKS DIRECTOR

The City water system is operated by the Public Works Department. In the event of an emergency sufficient to activate the EOC, the City's Public Works Director or designated representative will locate to the EOC at the Police Department. The Public Works EOC representative is responsible for coordinating all public works functions with other

members of the EOC Operations Group. The Public Works Director also serves as the Public Information Officer for all Public Works matters.

### UTILITIES MANAGER

The water system is one of several utilities within the Public Works Department that is managed by the Utilities Manager, who reports directly to the Public Works Director. In the event of an emergency involving the water system, the Utilities Manager will serve as the on-scene Incident Commander until properly relieved by an appropriate Police or Fire Department representative. The Utilities Manager is responsible for all aspects of the water system during an emergency, including damage assessments, assessing customer impacts, coordinating with jurisdictional public health agencies and adjacent water utilities, keeping the public and media informed through the City's Public Information Officer, and working with the Public Works Engineering Manager for design and construction services required for repair and recovery operations.

### OPERATIONS LEAD

The water utility has a Lead operator reporting to the Utilities Manager, who is responsible for operating the water system during an emergency. The Lead Operator assists the Utilities Manager in damage assessments and coordinating repair and recovery operations.

### WATER QUALITY MONITOR

Within the water division a water system operator is assigned responsibility for water quality monitoring. The responsibilities for water quality monitoring for routine compliance sampling and testing are outlined in the Operations and Maintenance manual. Positive coliform events of the water system require the water quality monitoring operator to follow procedures as outlined in the water sampling and monitoring section within this plan. Intentional contamination of the water system is covered in a separate incident specific plan at the end of this plan.

## WATER SYSTEM COMMUNICATION PROCEDURES

The City Disaster Manual establishes communications procedures during an emergency. The City utilizes a 911 call service operated by CRESA, which provides dispatch services for fire police and emergency medical services.

The City maintains emergency phone number lists for use by City personnel. The list contains City staff home phone numbers, addresses and cell phone numbers. The second list includes the numbers for emergency services, generator rentals, adjacent utilities, fuel suppliers, parts supplies, safety equipment, pumper trucks, and contractors. The

emergency phone numbers are updated frequently as phone numbers change. These lists are provided in the Appendix G.

The employee on-call will be the first person notified in the event of an emergency, disaster, or incident. The responding party shall report to the command center for a briefing and further instructions. The on-call employee shall be in charge of all Public Works functions until relieved by a higher-ranking Public Works employee.

At the command center, the on-call employee will receive a "Public Works Department Duty Checklist." A copy of this form is provided in the Appendix H. The employee is to fill out the checklist. The employee is to determine if it is within the employee's capabilities to handle the incident requirements of the Public Works Department. If the employee is unable to fill the needs of the incident, the employee shall notify the Water/Sewer Supervisor. The Water/Sewer Lead Operator shall notify the Public Works Utilities Manager of the incident.

The City of Camas Disaster Manual provides additional procedures for Public Works response. A copy of this document can be found in the offices of the Public Works Director and the Public Works Operations Manager. It is an orange manual and all Public Works employees should be familiar with the contents and procedures.

In the event that public notification is required during a water system emergency, the Public Works Director provides information to the media for this purpose.

Liaison with the Washington State Department of Health (DOH) is normally the responsibility of the Public Works Director. An emergency contact list for DOH is presented in Table 5-2.

**TABLE 5-2**

**Emergency Contact List for DOH**

| Agency/Contact | Contact Telephone Number | Purpose |
|---|---|---|
| DOH Hot Line<br>DOH SWRO After Hours | (877) 481-4901<br>(360) 236-3030 | After Hours Emergencies. |
| DOH/Regional Engineer | (360) 236-3018 | Regulatory Assistance |
| DOH/Coliform Program Manager - SWRO | (360) 236-3044 | Coliform Monitoring |

The City has entered into a mutual aid agreement with the City of Vancouver and several other public works organizations. The contact names and phone numbers for the responsible individuals for those purveyors are presented in Table 5-3.

**TABLE 5-3**

**Mutual Aid Water Utility and Public Works Contacts**

| Utility | Contact Person | Contact Number | |
|---|---|---|---|
| | | Phone | FAX |
| City of Vancouver | Tyler Clary | (360) 487-7169<br>(360) 989-6381 | (360) 696-8002 |
| City of Washougal | Trevor Evans | (360) 835-2662<br>(360) 835-8501 | (360) 835-8808 |
| Clark County | Ahmad Quayomi | (564) 397-4358 | (360) 397-6051 |
| Clark Public Utilities | Doug Quinn | (360) 992-8022<br>(360) 992-3000(1) | (360) 992-8027 |
| Washington State Department of Transportation | Bob Kofstad | (360) 905-2007<br>(360) 921-9119(1) | (360) 905-2075 |

(1) After hours

# PERSONAL SAFETY

## EVACUATION PLANS

The City's Disaster Manual provides limited guidance for evacuation operations. The Police Department has overall responsibility for evacuation operations. Each City Department and Division is responsible for developing emergency evacuation plans for its department/division.

The on-scene incident commander will normally direct evacuation operations. The Incident Commander at the scene will initially be the senior City employee at the scene; the on-scene incident commander duties will eventually be assumed by a Police or Fire Department representative depending upon the nature of the emergency.

The Occupational Safety and Health Administration (OSHA) provides guidance on developing evacuation plans for terrorist incidents:

http://www.osha.gov/dep/evacmatrix/index.html

Per the City's Disaster Manual, the Fire Department will be responsible for incident command during a hazardous materials (HAZMAT) release as this duty requires specific training and certification under federal regulations. City and Regional Emergency Plans for terrorist incident response also require that HAZMAT protocols and procedures be followed for incidents involving the intentional release of chemical and biological agents.

## EVACUATION ROUTES AND EXITS

Evacuation routes and exits for City facilities are to be posted at each facility. In the event of an evacuation from an area that encompasses more than one facility, the City Police or Fire Department will identify additional evacuation routes as needed. During an incident involving the release of hazardous materials, the Fire Department is responsible for identifying evacuation routes that mitigate hazards to evacuees. In the absence of direction from the Fire Department, the general rule for evacuation during a hazardous materials release is to travel uphill and upwind of the release.

## ASSEMBLY AREAS AND ACCOUNTABILITY

Assembly areas for evacuation from City facilities are posted along with evacuation routes and exits at City facilities. In the event of an evacuation from an area that encompasses more than one facility, the City Police or Fire Department will identify additional assembly areas as needed. The senior water division employee is responsible for ensuring that all personnel are accounted for at the assembly area after an evacuation has been conducted.

## SHELTER

Sheltering is not addressed in the City's Disaster Manual. The City defers to CRESA for emergency sheltering operations. The City is responsible for sheltering of City employees; this responsibility includes identifying City facilities that may be used for sheltering during a emergency.

## TRAINING AND INFORMATION

All water utility employees are provided with the following training:

- Blood borne pathogens
- Cardiopulmonary resuscitation (CPR)
- Defensive driving
- Emergency first aid
- Emergency response awareness (including FEMA ICS - IS195)
- Equipment lock-out/tag-out procedures
- Fall protection
- Fire extinguishers/evacuation
- Hazard communication
- Hearing conservation and testing
- Protection from water borne pathogens

When appropriate for their duties, water utility employees are provided training in:

- Bucket truck
- Confined space (aerial platform)
- Forklift operation
- Respiratory protection and fit testing
- Trenching and shoring

Water utility employees are issued protective equipment appropriate to their job responsibilities including hard hats, safety goggles, work gloves and safety boots.

Recommended training: The water quality monitor should be trained in hazardous materials awareness (reference: 29 CFR 1910.120). This training is available from the City Fire Department.

**Emergency Equipment**

The water utility has a hoist, harness and gas detection equipment for confined space entry. All employees are issued hard hats and reflective safety vests. All trucks are equipped with emergency first aid kits.

**FIRST AID**

Water utility employees are trained in emergency first aid that includes the following:

- How to determine the safe response to an emergency situation.
- Recognizing and caring for life-threatening emergencies in adults, such as respiratory, choking, and cardiac problems.
- Caring for injuries including severe cuts and burns, sprains and strains.
- Caring for sudden illnesses such as poisonings, bites, and stings.
- Recognizing and caring for heat- and cold-related emergencies.
- Workplace emergency procedures, including notifications for medical emergencies.

The Fire Department provides emergency medical services for trauma victims whose injuries exceed emergency first aid treatment.

# IDENTIFICATION OF ALTERNATIVE WATER SOURCES

## INTERTIES

The City has interties with the City of Washougal and the City of Vancouver that would normally be used to supply water to either City. The City has no other interties and therefore, must generally be self-sufficient in the event of a water shortage or water system failure. If necessary, the City would consider attempting to pump (boost) water from either Washougal or Vancouver into the City's system.

## REDUNDANCY IN CITY WATER SYSTEM

The City has several wells and a surface water source that provide some redundancy in the event certain elements of the water system fail. For example, if the Washougal Wellfield is flooded, the surface water source may serve as a backup, with water conservation measures in place to offset the loss of the wellfield.

### Emergency Water Supplies

Under the County's CEMP, citizens are urged to keep a 72-hour supply of food and water in the event of an emergency. The City will endeavor to supply potable water to support emergency operations within its capabilities.

## TRANSPORT OF POTABLE WATER DURING EMERGENCIES

If the City obtains potable water by transporting from another source, DOH has issued guidelines for water system utilities that deliver potable water to the public during emergencies. This guidance is found at the following website and are summarized below:

http://www.doh.wa.gov/ehp/dw/Publications/Truck_Transport.htm

### General

- DOH recommends that someone with water treatment expertise be responsible for the operation and management of trucked potable water.

- The City should contact the regional office of the DOH Division of Drinking Water (DOH-DDW) or local health department to discuss current requirements and approve the proposed operation. [see WAC 246-290-415(2)(d) and 246-290-451(4)]. Northwest Regional Office (Kent) – (253) 395-6750.

## Truck Container

- The truck container must be contaminant-free and capable of being maintained so that water contamination is prevented.

- If a truck container has been previously used only for potable water and has been protected from possible contamination, it may be used without disinfection and testing for bacteria.

- Truck containers that cannot pass the initial testing criteria after disinfection (i.e. absence of coliforms) shall not be used.

- Trucks previously used for substances other than potable water will be evaluated on an individual basis. Consult with DOH before using trucks that may have previously carried toxic or other non-potable liquids.

- All truck containers must be filled or emptied through an air gap or approved double-check valve assembly, in accordance with WAC 246-290-490.

## Initial Truck Disinfection

- The tank and all hoses, pumps, and other equipment used in handling water should disinfected by filling with water containing at least 50 to 60 parts per million (ppm) of chlorine and then held in the tank for at least 24 hours.

- One gallon of liquid bleach is required in every 1,000 gallons of water to produce 50 to 60 ppm. Bleach should be 5.25 to 6 percent hypochorite with no additives. Bleach should be added in proportion to the water as the tank is being filled, e.g., add approximately one-half gallon of bleach with each 500 gallons of water.

- The chlorine solution must be flushed from the tank after 24 hours.

- Once the tank is emptied, refill it with the water to be transported, and test for coliform bacteria. If coliforms are present, repeat the process. If the tank cannot be disinfected to eliminate coliforms, it must not be used.

- Water to be transported by tank trucks should contain a free chlorine residual of about one part per million (1 ppm or 1 mg/L) at the beginning of the haul.

**Source of Water**

- The source for emergency trucked water must come from an approved public water supply, unless otherwise approved by DOH.

- Every precaution should be taken to ensure that the water remains potable once it is collected and transported.

**Receiving Tank**

- The water system's receiving tanks must be inspected to assure that water quality issues will not occur during filling and later distribution to consumers.

- Receiving tanks must be cleaned and disinfected using the procedures for truck containers (see "Initial Truck Disinfection" guidelines).

- The receiving tanks must be kept secure and protected from contamination throughout the emergency response.

- The customer's receiving tank must be filled through an air gap or an approved double-check valve assembly in accordance with WAC 246-290-490.

**Documentation and Record Keeping**

- The receiving water system is responsible for documenting and keeping proper records of the emergency trucked water operation.

- Records should be retained for at least 6 months for review upon request by health agencies, haulers, or the supplying water system.

## REPLACEMENT OF EQUIPMENT AND CHEMICALS

### EQUIPMENT AND SUPPLIES

A list of equipment suppliers that the City has access to for emergencies is provided in Appendix I.

### CHEMICALS

Table 5-4 lists chemicals used by the City in its water treatment processes. Appendix J provides a list of chemical suppliers.

To assist the City in identifying chemicals with emergency planning implications, threshold quantities under EPCRA, the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), and the Clean Air Act (CAA) are also shown in Table 5-4, where applicable.

The applicability of each regulation is briefly discussed below.

Use and Storage – EPCRA governs reporting requirements for chemicals, either in use or in storage, that pose a significant environmental or health hazard.

Liquid Spill – In the event of a spill where the quantity exceeds the CERCLA threshold, certain reporting requirements will be in effect.

Risk of Air Release – Gaseous chemicals will require a risk management plan if they exceed threshold quantities.

Explanatory notes following Table 5-4 provide greater detail regarding reporting requirements.

The City should coordinate all EPCRA, CERCLA and CAA planning and reporting requirements with CRESA.

Hazardous substance releases should be reported to the Washington State Department of Ecology (Ecology) and responses coordinated with CRESA through the City Fire Department.

CRESA Phone: (360) 737-1911

Ecology 24-Hour Spill Response Phone: (800) 258-5990
National Response Center (800) 424-8802

## TABLE 5-4

## Water Treatment Chemicals used by the City of Camas

| Name[1] | Use[2] | CAS/EPCRA Section 313 Category Codes[3] | EPCRA Section 302 EHS TPQ[4] (pounds) | EPCRA Section 304 EHS RQ[5] (pounds) | CERCLA RQ[6] (pounds) | EPCRA Section 313[7] | CAA 112(r) TQ[8] (pounds) |
|---|---|---|---|---|---|---|---|
| Sodium fluoride (> 99%) | F | 7681-49-4 | N/A | N/A | **1,000** | N/A | N/A |
| Sodium hydroxide (20 – 30%) | CO/pH | 1310-73-2 | N/A | N/A | **1,000** | N/A | N/A |
| Sodium hypochlorite (5-12.5%) | DI | 7681-52-9 | N/A | N/A | **100** | N/A | N/A |

All reporting quantities noted in **bold** font n/a = not applicable.

(1) The chemicals listed above were taken from an extensive inventory of chemicals provided in a document titled *List of Lists, Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act (consolidated list), EPA,550-B-01-003, October 2001.* EPA put the list together to help chemical handling firms determine what reporting requirements apply under sections 302, 304, or 313 of EPCRA and if they are subject to the accident prevention regulations under CAA section 112(r). The chemical names are those that are generally used in the regulatory programs developed under EPCRA, CERCLA, and CAA section 112(r)

(2) Use Definitions: Coagulant (CG); Corrosion Control (CO); Disinfection (DI); Fluoridation (F); pH Adjustment (pH).

(3) The chemicals above are organized under the Chemical Abstracts Service (CAS) registry number and the EPCRA Section 313 category codes.

(4) EPCRA Section 302 includes a list of *Extremely Hazardous Substances* (EHSs). The presence of EHSs in quantities at or above the Threshold Planning Quantity (TPQ) require local emergency planning committees to develop emergency response plans and notify State emergency response committees. Facilities with a listed EHS are subject to the reporting requirements of EPCRA section 311. The facility must provide a material safety data sheet or a list of covered chemicals to State and local emergency response committees and the local fire department. The minimum TPQ for section 311 reporting is 500 pounds or the TPQ, whichever is less. EHS TPQ and RQ are represented in pounds.

(5) Under EPCRA Section 304, releases of reportable quantities (RQ) of EHSs are subject to State and local reporting.

(6) Under Section 304 of EPCRA, releases of hazardous substances listed in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) are to be reported to the National Response Center, as well as to the State and local emergency response committees. The CERCLA RQ column shows the reportable quantities (in pounds) for chemicals that are CERCLA hazardous substances as listed in 40 CFR Part 302, Table 302.4. Solid metals listed under CERCLA, with mean diameters greater than 100 micrometers, are not reported. The CERCLA RQs listed above apply to smaller particles.

(7) Under the column titled Section 313, the notation "313" means that the chemical is required to report under section 313 and 6607 of the Pollution Prevention Act. An "X" indicates that this chemical may have a second name or that the same chemical may have the same CAS number listed under a different name. The lower case "c" indicates that a chemical must report under one or more of the EPCRA section 313 chemical categories even though it has no CAS number.

(8) Under CAA section 112(r) EPA identified 77 toxic substances and 63 flammable substances, including their threshold quantities (TQs), which are subject to accident prevention provisions. The requirements for risk management programs for accidental release prevention are found in 40 CFR Part 68. CAA section 112(r) lists several substances in solution that are covered only in concentrations above a specific level. Most of these chemicals are listed above and include ammonia CAS #7664-41-7 (concentrations 20 percent or greater); hydrochloric acid CAS #7647-01-0 (concentrations 37 percent or greater); hydrogen fluoride/hydrofluoric acid CAS #7664-39-3 (concentrations 50 percent or greater); and nitric acid CAS #76997-37-2 (concentrations 80 percent or greater). CAA section 112(r) TQs are in pounds and apply to those quantities within a process and not at the facility as a whole.

## PROPERTY PROTECTION

The City controls access to its water facilities using barriers and locks. Reservoirs are fenced, with access controlled by locked gates. Utility vaults are covered and locked. The City maintains strict control over its keys. Employees are issued keys only to those facilities they are required to access to perform their duties. The City has also partnered with residential customers to be vigilant of the areas around its well and reservoir sites to alert the City if they notice any suspicious activity.

## WATER SAMPLING AND MONITORING

Water sampling for routine compliance is described in Chapter 2 of this manual.

Water sampling and monitoring for a coliform incident is described below under incident specific plans (bacteriological contamination).

Water sampling and testing for a suspected intentional contamination incident is described below under incident specific plans.

## MAJOR WATER SUPPLY INTERRUPTIONS

### WATER MAIN BREAKS

Depending on the location where the main break occurs, if susceptible populations are impacted, use contact list in Appendix B (Coliform Monitoring Plan) for notification. City will provide bottled water for lengthy outages. Depending on circumstances, portable toilets may be supplied as well. Trucked potable water may be provided. If the City uses trucked potable water, the guidelines in DOH Publication #331-063 will be followed.

The City maintains an inventory of piping and fittings to address most emergency repair requirements and has a list of vendor telephone numbers to obtain supplies when existing material stocks are inadequate for emergencies. When repairs are too large for City crews to manage, the City will contact contractors from its small works roster.

When water supply interruptions for a pressure zone are expected to be lengthy, the City will consider instituting measures to allow customers to come to a reservoir and obtain water directly from a reservoir. Any water dispensed in this manner will be done under the supervision of a City employee.

## BOOSTER STATIONS

The City has developed detailed written procedures for operating the water system when booster stations are not in service and has figures showing locations of pumps, piping, meters, shut off valves and other key features of each facility, such as valve size/type, motor manufacturer/type/hp and pump capacity/type. Copies of these procedures, technical details and figures are kept at each facility.

A brief summary of the booster station emergency procedures follows.

### Butler Booster Station

Auxiliary Power

The Butler Booster Station does not have an auxiliary power system.

HOA Setting

Emergency operation of the booster station may require the pump to be operated in the HAND mode to compensate for distribution system problems in other areas of the system during a power outage.

Backup Operations

Angelo Booster Station serves as a backup for feeding the Lower Prune Hill (455) Zone if the Butler Booster Station is out of service. The City has a standby pump for the 455 Zone at the Angelo Booster Station in the event that a pump is out of service. There is sufficient pumping capacity to the 455 Zone to operate with the largest pump out of service under normal system demands, including fire flow.

### Gregg Booster Station

Auxiliary Power

The New Gregg Booster Station has a diesel powered 300-kW generator with automatic transfer switch capable of operating the New Gregg Booster Station pumps during a power outage.

HOA Setting

Emergency operation of the booster station may require the pump to be operated in HAND mode to compensate for distribution system problems in other areas.

Backup Operations

There is no back up in the event Gregg Booster Stations are out of service; however, there is sufficient pumping capacity at the Gregg Booster Stations to operate with the largest pump out of service under normal system demands, including fire flow.

**Angelo Booster Station**

Auxiliary Power

The Angelo Booster Station is equipped with a 200-kW diesel generator with an automatic transfer switch. This generator is capable of providing power to three of the pumps, the lighting, and the HVAC system.

Backup Operations

If Angelo Booster Station is out of service, Butler Booster Station and Forest Home Booster Station serve as back up to feed the upper zones (Lower Prune Hill, Lacamas, Upper Prune Hill) from the lower zone (Butler). The City has a standby pump at the Angelo Booster Station in the event that a pump is out of service. There is sufficient pumping capacity to the 455 Zone to operate with the largest pump out of service under normal system demands, including fire flow.

Lower Prune Hill Reservoir Out of Service

If the Lower Prune Hill Reservoir is out of service, one pump at the station will be placed into hand mode and operated with the reservoir isolated. The pressure relief valve at the station will bleed excess pressure to the inlet piping. This will allow the system to maintain a constant pressure in the zone. During this operation, the pump and pressure need to be monitored every two hours.

**Forest Home Booster Station**

Auxiliary Power

Auxiliary power is not available for the Forest Home Booster Station.

HOA Settings

During emergencies the booster station may need to be operated in the HAND mode to compensate for distribution system problems in other areas of the system.

Backup Operations

If the Forest Home Booster Station is out of service, Butler Booster Station and Angelo Booster Station serve as back up to feed the upper zones (Lower Prune Hill, Lacamas, Upper Prune Hill) from the lower zone (Butler). The City has a standby pump at the Angelo Booster Station in the event that a pump is out of service. There is sufficient pumping capacity to the 455 Zone to operate with the largest pump out of service under normal system demands, including fire flow.

**Lacamas Booster Station**

Auxiliary Power

The Lacamas Booster Station has an auxiliary generator with automatic transfer switch available to provide power. This generator is a 60 kW natural gas generator and is capable of running the two 500-gpm pumps, the building lights and ventilation system. This generator is able to provide the Lacamas Booster Station with power as long as natural gas service is not interrupted. If the generator fails during a power outage, water service can be maintained through the pressure reducing valve (PRV) stations that that connected to the system that feeds down from the Upper PruneHill Reservoir. Well No. 9 also serves the area supplied by Lacamas Booster Station, but since it does not have auxiliary power, it is more than likely unavailable during a power outage.

Lacamas Reservoir Out of Service

When the Lacamas Reservoir is out of service, pressure to the Lacamas (544) Zone can be maintained by operating one of the pumps in the Lacamas Booster Station. The pressure relief valve will return excess pressure to the inlet piping while maintaining the downstream pressure. Under this operating condition, the pump operation and pressure need to be checked every 2 hours. The 544 Zone can also be served from Upper Prune Hill through PRV stations.

Backup Operations

When the Lacamas Booster Station is out of service Well No. 9 and the Lower Prune Hill Booster Station can be used to feed the Lacamas (544) Zone.

**Lower Prune Hill Booster Station**

Auxiliary Power

This facility is equipped with a 300-kW diesel powered generator with an automatic transfer switch to operate the three pumps in the event of a power failure.

Temporary Pump

During high seasonal demands a mobile skid mounted pump is rented by the City to supplement the LPH Booster Station. This pump is installed via connections constructed for this purpose near the entrance to the pump station. It is operated in a manual mode and has a capacity between 600 and 700 gpm. This pump is not powered by the auxiliary power generator. The City also has pumping capacity available at the Upper Prune Hill Booster Station to serve the Upper Prune Hill area for temporary losses of service at the Lower Prune Hill Booster Station, but this is limited and cannot provide supply for extended interruptions in service or extended periods of high demands.

**Upper Prune Hill Booster Station**

Auxiliary Power

The Upper Prune Hill Booster Station is equipped with a manual transfer switch to allow the City to bring in a portable generator to supply power to the booster station. The portable generator used by the City can operate two of the 20-hp pumps.

**RESERVOIR EMERGENCY PROCEDURES**

**General**

The City has developed detailed written procedures for operating the water system when reservoirs are not in service. These procedures are kept at each facility. If a reservoir must be taken off line isolation valves are used to prevent water from being pumped into the reservoirs and the reservoirs are allowed to empty into the distribution system.

A brief summary of the reservoir emergency procedures follows.

**Butler Reservoir**

Water service is maintained to the system during cleaning / draining / disinfection of the reservoir with the following procedures.

- Connect 6-inch overflow piping to the 12-inch main in the Butler Yard.
- Open the 6-inch overflow valve.
- Open the 4-inch main connecting line valve between the 12-inch and 14-inch mains until water comes out of the 6-inch overflow.
- Close the two 12-inch valves in the reservoir valve pit to take the Butler Reservoir offline.

- Adjust the 4-inch connecting valve to maintain a small amount of water flow from the 6-inch overflow. As long as water flows from the overflow, water service will be maintained to the 343 Zone.

- Depending on the season and the demand, a well may need to be in operation to maintain system pressure in the 343 Zone.

- The pressure reducers on NE 22nd Avenue and NE Everett Street regulate pressure and keep the 343 Zone served.

Reverse the order to place the reservoir back online.

**Gregg Reservoir**

Water service can be maintained to the Gregg area by running a pump in the HAND position in the Gregg Booster Station. The pressure relief/bypass valve at the Gregg Booster Station will maintain pressure in the service area and also keep it from over pressurizing the zone. The Gregg Reservoir can be isolated after the pump in the Booster Station is placed into operation. Close attention will be paid to the system pressure and the pump to provide uninterrupted service.

**Lacamas Reservoir**

The Lacamas Reservoir is supplied from the Upper Prune Hill Zone via PRVs, from the Lower Prune Hill Zone via the Lacamas Booster Station, or from Well No. 9. As long as one of these facilities is in operation, the reservoir can be filled.

Water service can be maintained to the Lacamas area (544 Zone) by running a pump in the HAND position in the Lacamas Booster Station or Well No. 9. The pressure relief/bypass valve at the Lacamas Booster Station will maintain pressure in the service area and also keep it from over pressurizing the zone. The Lacamas Reservoir can be isolated after the pump in the Booster Station is placed into operation. Close attention must be paid to the system pressure and the pump to provide uninterrupted service.

**Lower Prune Hill (LPH) Reservoirs**

Emergency operation of the reservoir would be required if a problem were to occur with one of the reservoirs. If a reservoir were to experience a physical or water quality problem, one reservoir could be taken out of service and the remaining one could be used to supply water until the problem is solved. If the smaller of the two tanks was used alone, the start levels for the Butler, Forest Home, and the Angelo Booster will be raised to keep the reservoir full at all times.

**Upper Prune Hill (UPH) Reservoirs**

UPH 2.4-MG Reservoir

The 2.4-MG reservoir inlet has an altitude valve that closes to allow the UPH standpipe to fill when the reservoir is full (63-foot level). The UPH 2.4-MG reservoir outlet valve is normally opened, but is seismically controlled and will close in a seismic event. The UPH booster pumps will also be turned off in a seismic event.

If both the Lower Prune Hill and Upper Prune Hill Booster Stations are out of service and the Upper Prune Hill Standpipe level drops low enough, site valves can be opened to allow both the standpipe and the 2.4-MG Reservoir to float on the system.

Two of the booster pumps (No. 2 and No. 3) are equipped with modified pump control valves that employ two valves that are adjusted to drain the UPH 2.4-MG reservoir. Detailed procedures for using these pump control valves are provided at the UPH booster station.

UPH Standpipe

The UPH standpipe inlet valve is a spring-activated altitude valve that is designed to shut off when the standpipe is full. This valve is not controlled by the telemetry system. When the UPH standpipe altitude valve is closed, the UPH booster pumps operate based on the pump discharge pressure.

If the Upper Prune Hill Standpipe is out of service, the UPH area can be supplied by the UPH Booster Station and the LPH Booster Station. The LPH Booster Station operates based on reservoir level in the 2.4 MG UPH Reservoir. If the LPH Booster Station flows exceed system demands, the 2.4 MG UPH Reservoir will fill. If the 2.4 MG UPH Reservoir is full, the LPH Booster Station will shut off and the UPH Booster Station will be called in pressure mode and will supply the system. If system demands exceed the supply of the LPH Booster Station while it is in operation, the UPH Booster Station will be called in pressure mode to provide additional supply. Pressure mode for the UPH Booster Station is discussed below.

At the Upper Prune Hill Pump Control Panel Screen, the operator selects this setting at the pump control panel, which is a six step operating sequence (numbered 0 to 5) that is based satisfying a minimum pressure of the pump discharge. The operator sets the pressure at 40 psi, which simulates a full standpipe.

- Step 0 – no pumps on (40 psi is satisfied)
- Step 1 – pump 1 on and runs till 40 psi is satisfied
- Step 2 – pump 1 and 2 on if 40 psi is not satisfied after Step 1
- Step 3 – pump 1 and 3 on if 40 psi is not satisfied after Step 2

- Step 4 – pump 1, 2 and 3 on if 40 psi is not satisfied after Step 3
- Step 5 – all pumps on if 40 psi not satisfied after step 4

There is a 15 second delay built in between each step. Pumps turn off sequentially in 15 second intervals once 40 psi is satisfied.

**WELLS**

Detailed written operating instructions are maintained at each well. These instructions cover normal operations as well as response to pump and power failure. For wells with treatment facilities, written descriptions of shutdown and start up of treatment equipment is included with the written procedures. A brief summary of emergency operations at each well is provided below.

**Well No. 5**

There is neither a generator nor an angle drive to operate Well No. 5 during a power outage. Well No. 5 can be used to maintain pressure in the lower grid when the Butler Reservoir is out of service. Under these conditions, Well No. 5 has to be run from the HAND position from the pump house or the Operation Center master telemetry unit.

**Well No. 6**

There is neither a generator nor an angle drive to operate Well No. 6 during a power outage. Well No. 6 can be used to maintain pressure in the lower grid when the Butler Reservoir is out of service. Well No. 6 has to be run from the HAND position from the pump house or the Operation Center master telemetry unit.

**Well No. 7**

There is not a generator or an angle drive to operate Well No. 7 during a power outage. Well No. 7 can be used to maintain pressure in the lower grid when the Butler Reservoir is out of service. Well No. 7 has to be run from the HAND position from the well facility or the Operations Center master telemetry unit.

**Well No. 8**

During a power outage, Well No. 8 has an auxiliary engine and angle drive. Well No. 8 can be used to maintain pressure in the lower grid when the Butler Reservoir is out of service. Well No. 8 has to be run from the HAND position from the pump house or the Operation Center master telemetry unit during a power outage. The backup chlorination system is also run by the generator.

**Well No. 9**

There is neither a generator nor angle drive to operate Well No. 9 during a power outage.

**Well No. 10**

There is neither a generator nor angle drive to operate Well No. 10 during a power outage.

**Well Nos. 11 and 12**

The Washougal Wellfield Facility has its own diesel powered auxiliary generator with an automatic transfer switch. This generator is 350 kW and is designed to serve the Washougal Wellfield Treatment Facility during a power outage, to include the two well pumps, chemical feed pumps, controls for the well pumps and chemical feed system, HVAC system and lighting.

**Well No. 13**

The Well No. 13 Facility has its own diesel powered auxiliary generator with an automatic transfer switch and acoustical enclosure. This generator is 250 kW and is designed to serve the Well 13 Facility during a power outage, to include the well pump, chemical feed pumps, controls for the well pump and chemical feed system, HVAC system and lighting.

**Well 14**

The Well No. 14 Facility has its own diesel powered auxiliary generator with an automatic transfer switch and acoustical enclosure. This generator is 250 kW and is designed to serve the Well 14 Facility during a power outage, to include the well pump, chemical feed pumps, controls for the well pump and chemical feed system, HVAC system and lighting.

**SURFACE WATER FILTRATION PLANT**

Detailed written operating instructions are maintained at the Slow Sand Water Treatment Facility. These instructions cover normal operations as well as start up and shut down procedures. The plant is equipped with a 45 kW propane powered auxiliary generator in event of a power outage.

## INCIDENT SPECIFIC RESPONSE PLANS

Per the hazard assessment summarized in Table 5-1, the following incident specific response plans are outlined below:

- Drinking Water Unique: bacteriological contamination
- Natural Disasters: drought, earthquake, flood, landslide/mudflow/debris flow, severe snow storm, tsunami, volcano
- Technological Hazards: power failure, dam failure, hazardous materials, urban fire, transportation accident
- Criminal Acts: Terrorism, cyber attack, vandalism

## BACTERIOLOGICAL CONTAMINATION

WAC 246-290-320 establishes specific procedures for water utilities to follow should bacteriological contamination be detected in the water system. These procedures are outlined in Figure 5-1. If the chlorine disinfection residual in the distribution system is lost, it may be necessary to batch chlorinate the reservoirs and flush distribution piping.

For every 1.0 million gallons of storage, approximately 17 lbs. of 70 percent calcium hypochlorite (HTH) is necessary to provide a 1.0 mg/L chlorine residual. As an alternative, 18 gallons of 5.25 percent sodium hypochlorite, available as household bleach in the supermarket, can be added to 1.0 million gallons to provide a dose of 1.0 mg/L.

In the event of a suspected intentional contamination with a microbial agent, the protocols for intentional contamination shall be followed in addition to the procedures outlined here. Law enforcement authorities will need to be consulted prior to making public notifications as discussed further in the intentional contamination incident plan.

### Boil Water Notification

Emergencies such as floods, earthquakes, and other disasters can result in damage to water system infrastructure, thereby warranting a boil water notice as a cautionary measure. A suggested boil water notification form is presented in Appendix K. The City would issue the order through radio, television and newspapers serving the local area. Prior to the issuance of a boil water notice, the City should consider the experience gained by other communities in the past. A summary of pertinent information follows:

- An initial press conference should be held following issuance of the boil water notice to advise the public of the situation. All press releases will go the City's Public Information Officer.

- Consolidated press releases, announced on morning and evening television and radio news broadcasts, can also be used to keep the public informed.

- A 24-hour telephone hotline will be established to respond to public and media inquiries regarding the notice. The hotline should be staffed with knowledgeable representatives from the City and other governmental agencies. In order to maintain the consistency of information released, hotline operators should be provided with standard question and answer sheets and briefed as new information becomes available. The hotline should remain available for 24 hours after the boil water notice has been rescinded to provide relevant information and reassurance for concerned customers. All media inquiries shall be directed to the Public Information Officer.

- Other State, County, and City agencies will be consulted prior to release of information to the public, including DOH and the Clark County Health Agency. A consensus will be reached among the jurisdictional agencies regarding information to be released and actions to be taken. It is important not to release conflicting information so as not to confuse the public.

- Agencies and hot line phone operators should be aware of difficult questions that could be asked by the public or the press. A few examples follow:

    1. What other utilities are affected?

    2. What should be done about coffee and ice machines that use water directly from the system?

    3. How did the system get contaminated and what is being done about it?

- Protocol should be developed for rescinding the boil water notice. One example includes two consecutive days of no detection of Cryptosporidium, Giardia, or coliform bacteria in the system.

- Once the boil water notice is rescinded, a notice should be developed to inform the public regarding appropriate measures for use of the water supply including flushing of pipes and fixtures as required.

A thorough investigation of the contamination source should be conducted and strategies developed to avoid similar future occurrences. The public should be informed and given

updates regarding investigation findings in order to restore confidence in the quality of water provided by the water system.

## DROUGHT

The Clark County Hazard Identification and Vulnerability Analysis states that nearly all areas of the county are vulnerable to drought.

History suggests a high probability of occurrence in Clark County. Although the entire population of the county is considered vulnerable to the effects of drought, severity has historically been low. Actual drought conditions have been limited to a few days, even during extended dry periods.

The hazard of a short-term drought will be addressed through water conservation measures outlined in the Water Conservation Chapter of the Water System Plan. The City will need to coordinate with adjacent water users in developing an effective drought response. This type of coordination will become essential with longer drought periods when more stringent water conservation measures may become necessary. Additionally, extended droughts may also increase fire hazards, particularly in the heavily wooded areas of the City.

## EARTHQUAKE

The County's assessment indicates that of all potential disasters, the City is most vulnerable to a severe earthquake. However, the ability of the City's water system facilities to withstand a major earthquake has not been fully characterized.

The Northridge earthquake, which struck on January 17, 1994, left the Metropolitan Water District of Southern California (MWDSC) facing a major disaster. Fortunately, the MWDSC had established emergency planning procedures that proved to be essential to restoring water service to its customers. Two essential components were an Emergency Response Center and pre-established reconnaissance patrols that were able to quickly conduct damage inspections. The MWDSC had also stockpiled considerable repair parts and materials in order to be virtually self-sufficient in an emergency. Following the Northridge earthquake, however, the MWDSC found that most parts and equipment were readily available via overnight shipping from around the nation, indicating that stockpiling does not need to be wholly relied on for effecting repairs.

The Pacific Northwest is a very seismically active area. The Clark County HIVA states that potential earthquake sources in Clark County are not well characterized because of their infrequent occurrence compared to California. Estimations of possible earthquake sources are limited to studies of many small earthquakes, investigations of known faults, and other geological surveys.

CRESA indicates that earthquakes in Clark County are most likely to originate from three sources: (1) the Mt. St. Helens seismic Zone; (2) the Portland/Vancouver Seismic Zone; and (3) the Cascadia Subduction Zone. Descriptions of each of these seismic zones are summarized from the Clark County HIVA below.

1. Mt. St. Helens Seismic Zone – This seismic zone is most commonly a source of several small earthquakes (<4 M). The strongest earthquake associated with this zone was the Elk Lake earthquake of February 13, 1981. This was approximately 5.5 M magnitude earthquake. While this was just a moderate earthquake it was felt over an area of about 104,000 $km^2$ that ran as far north as Ferndale, Washington and as far South as Salem, Oregon. Geologists suggest that the possibility exist for an earthquake as great as 6.5 M originating from this zone.

2. Portland/Vancouver – The Portland metropolitan area is the most seismically active region in Oregon in historic times. In the past 150 years there have been six earthquakes of magnitude 5 or greater. The Washington side of the seismic area is the second most seismically active area in Washington (the Puget Sound area is the most seismically active area in the state). The area between the Lacamas Creek Fault and the Portland Hills Fault borders this seismic region. The existence of the Portland Hills fault was only recently confirmed by the digging of the light rail tunnel through the West Hills of Portland. This discovery, matched with other geophysical studies suggest that earthquakes as large as 6 M or larger should occur in the Portland region every 300 to 350 years and an event of M 6.5 or larger about every 800 to 900 years. Earthquakes in this area present what may be the worst-case scenario for Clark County because the epicenters may be quite close. Geologists theorize there may be faults directly underneath the cities of Portland and Vancouver. Recent studies suggest that the epicenter for the 5.5 M earthquake in November 5, 1962, was located underneath the City of Vancouver.

3. Cascadia Subduction Zone – The Cascadia Subduction Zone lies about 50 miles offshore, extending from near Vancouver Island to northern California. The zone is where the oceanic Juan de Fuca plate dives beneath the continental North American plate. These plates are converging at a rate of 1 to 1.5 inches per year.

CRESA considers the entire county population, property, commerce, infrastructure and services as vulnerable to an earthquake. The scope of damage will be a function of earthquake magnitude and level of preparedness. Damage could range from minimal to extreme loss of life and destruction of property.

Most injury, death, and property damage in an earthquake result from seismic impacts on structural and non-structural materials. The vulnerability of certain areas partially depends on the types of structures in that area. A wood frame residential structure that is adequately secured to the foundation is relatively safe. An un-reinforced masonry building is at greatest risk from seismic impacts. Most injuries in earthquakes result from non-structural materials such as light fixtures, equipment, and furniture, falling on people and causing injury.

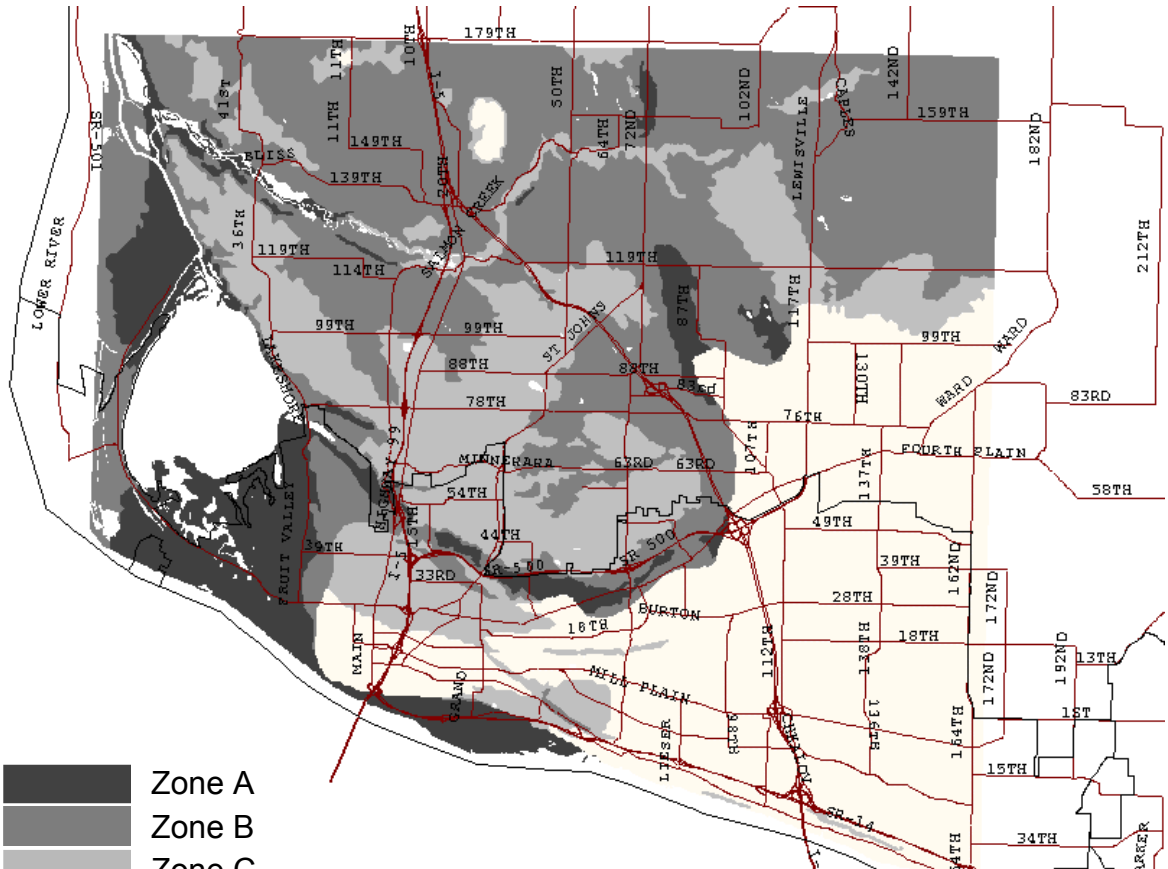
Another factor in earthquake vulnerability is soil type. Water-saturated loose sand and silt lose their ability to support structures in an earthquake. Areas in Clark County that are near flood plains or areas with silt deposits are at the greatest risk during an earthquake.

Within the limits of predictability, CRESA assigns a high probability of occurrence for a damaging earthquake during the next 25 years. A large earthquake could have a catastrophic impact on Clark County suggesting high vulnerability. Accordingly, a high-risk rating is assigned.

Figure 5-2 shows a map of Clark County with zones of relative hazards for earthquakes. Based on evaluation of soil liquifaction, ground amplification, and earthquake induced landsliding hazards. Zone A is area of greatest relative hazard. Zone D is area of least relative hazard. The City of Camas is primarily in Zone D.

**FIGURE 5-2**

**Relative Earthquake Hazard Map, Clark County, Washington**



Earthquake response measures for the City's water system are shown in Table 5-5.

**TABLE 5-5**

**Earthquake Response City of Camas Water System**

| Water System Component | Potential Effects | Recommended Actions |
|---|---|---|
| Transmission and Distribution System | Transmission and distribution system mains may be broken and the City's ability to monitor and respond to these incidents may be limited. | Isolate the major broken sections of piping throughout the system as they are located and repair as necessary and possible. Contact DOH. |
| Storage Facilities | Reservoirs may be leaking or structurally damaged | Inspect each reservoir for structural damage or cracks and leaks. Seal or drain these reservoirs as required. Contact DOH. |
| Booster Stations | Booster stations may be structurally damaged or mechanical damage to pumps and piping may have occurred. | Check booster stations and shut down pumps as required. If zones can be fed by alternate methods, implement those procedures. Contact DOH. |
| Wells | Unable to supply additional water to system. Well casings may be broken. Pumping capacity may be lost. | Investigate situation. Determine which wells can be utilized. Determine if surface water source still available. Contact DOH. |
| Treatment Facilities | Damage may have occurred to the treatment building, piping, or filters at the Slow Sand filter plant. May be unable to supply water from surface water source. | Shut down the equipment at the treatment facility. Attempt to repair. Check possibility of supplying City with groundwater sources. Contact DOH. |

## FLOOD

The Clark County HIVA states that floods are the most common disaster in Washington State and Clark County. The County's climate, topography, and geology are conducive to flooding. Normal annual precipitation ranges from 38 inches on the western floodplains to over 114 inches in the mountainous northeastern part of the county.

**History of Flooding in Clark County and Adjacent Areas**

- **December 1933** – The largest flood of record on the Lewis River.

- **May 30, 1948** – Columbia River crested at 34.4 ft. Flood stage at that time was 15 ft. This is the flood that destroyed the City of Vanport. Vanport, with a population at the time of the disaster of 18,500, was the second largest City in Oregon. The destruction of the town occurred when a 600-foot section of dike protecting the settlement from the rising Columbia River broke. Unfortunately, few people evacuated Vanport prior to the dam rupture. Evacuation was hampered by the fact that there were very few good evacuation routes. Fifteen people died in the flood.

- **June 1956** – Columbia River flooded due to snowmelt runoff.

- **January 1972** – A combination of intense rainfall and snowmelt caused major East Fork of the Lewis River floods.

- **December 1977** – Heavy rainfall and snowmelt caused flooding on the East Fork of the Lewis River. Salmon Creek had largest flood since gages were placed on Salmon Creek. The Washougal River also received its largest flood since gages were placed in 1944. This flood was an extremely rare event, greater than a 500-year flood.

- **February 8, 1996** – The Columbia River crested at 27.1 feet on February 9. This flood produced some of the worst flooding seen in the County since 1948. Approximately 1,500 people were evacuated, and 177 homes were destroyed. This flood occurred because of the confluence of several factors. The winter of 1995/96 was extremely rainy. Prior to the flooding period, the region experienced a cold snap with low elevation freezing, ice, and snow. This was followed by a strong warming trend with heavy precipitation.

In Clark County, the weather that produces the most serious flooding events are extensive wet conditions that follow a period of mid and high elevation ice and snow pack development. Many rivers in Clark County historically flood every few years. These include the East Fork of the Lewis River, Washougal River, Salmon Creek, and the Columbia River. Flooding on these rivers usually occurs between October and February. Long periods of heavy rainfall and mild temperatures coupled with snowmelt contribute to flooding.

There are three types of flood threats:

- Riverine

- Tidal
- Flash and Surface

The greatest threat of flooding in the City will be flash and surface flooding due to inundation of stormwater collection and conveyance systems. This may impact the water system operation through a number of mechanisms, including:

- Restricting access to water system facilities due to flooded streets
- Flooded valve and meter vaults
- Flooded City facilities
- Increasing groundwater levels that threaten contamination of leaking underground water lines

Actions the City will consider depending on the extent of flooding and the risks that might be mitigated include:

**Pre-Flood**

- Sandbagging around City facilities, such as the Public Works Operations Center
- Securing large pieces of equipment and materials that could be carried off by floodwaters
- Raising electronic equipment and computers off the floor
- Moving valuable records to locations expected to remain dry

**Post-Flood**

- Checking coliform levels in the water system for contamination (see incident specific plan for bacteriological contamination)
- Inspecting meters and PRV stations to ensure proper operation
- Cleaning debris from around reservoirs

Figure 5-3 includes a flood map of the City of Camas. As the flood map indicates areas susceptible to flooding include the Washougal Wellfield (Well Nos. 5, 6, 7, 8, 10 and 12 as well as the new chemical feed building).

Historically, flooding occurs along one or more of the County's waterways every few years, suggesting a high probability of occurrence. Because of the relative land area and population affected, the County is exposed to moderate vulnerability. Although the vulnerability is moderate, the frequency of flooding, the potential for simultaneous flooding events, plus the historical record of recurrent flooding and cumulative costs, all suggest the assignment of a high risk rating.

Table 5-6 lists flood response measures specific to the City's water system.

**TABLE 5-6**

**Flood Response City of Camas Water System**

| Water System Component | Potential Effects | Recommended Actions |
|---|---|---|
| Transmission and Distribution System | Transmission and distribution mains could be affected by landslides or high water levels. City staff transportation for monitoring the system and making repairs may be limited. | Monitor possible areas of concern for waterline conditions. Monitor waterline bridge crossings for possible damage. Prepare to valve off any washed out or damaged waterlines. Contact DOH. |
| Storage Facilities | Minimum physical/structural impact due to locations. Flooding could cause elevated coliform levels in water system. | Monitor coliform levels. Contact DOH to advise of acute of non-acute coliform violations. |
| Booster Stations | Minimal operational impact. | None. |
| Wells | Facilities could be overwhelmed by flood waters. | Prepare to disconnect any well affected by flood waters. Contact DOH. |
| Treatment Facilities | Heavy rainfall or snow melt may overwhelm the capacity of the water treatment facility. Flooding in the vicinity of the plant is a risk. | Allow the water to bypass the filtration plant by closing intake facilities. Use wells as source of water for City. Contact DOH. |

## LANDSLIDE/MUDFLOW/DEBRIS FLOW

The term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Landslides commonly occur on water-saturated slopes when the base of the slope can no longer support the weight of the soil above it, thus their frequency increases during or after periods of heavy rain and flooding. Though commonly associated with heavy rain and flooding conditions, landslides may also be associated with earthquakes (the 1994 Northridge Earthquake caused an estimated 11,000 landslides) and volcanic activity.

CRESA indicates that Clark County experienced the greatest number of landslides from 1996 to 1997. One of the largest landslides in the area occurred just outside of Clark County, two miles north of Woodland on February 8 and 9 when 32,000 $yd^3$ of earth fell across all lanes of I-5 and the adjacent railroad tracks, disrupting traffic until February 19. In the same flooding period there were also several landslides that disrupted railroad operations in the area adjacent to Vancouver Lake. The following year, which was marked by heavy rains but no significant flooding, there were several landslides. Clark County has several areas where landslides have taken place and several areas that are susceptible to landslides. The hills north of La Center and the slopes north of Camas and Washougal are particularly susceptible.

Slides in Clark County generally range in size from thin masses of soil of a few yards wide to deep-seated bedrock slides more than six miles across. Travel rate may range in velocity from a few inches per month to many feet per second, depending largely on slope, material, and water content. The recognition of ancient dormant slide masses is important as they can be reactivated by earthquakes or unusually wet winters. Also, because they consist of broken materials and disrupted ground water, they are more susceptible to construction-triggered sliding than adjacent undisturbed material.

CRESA states that typical effects of landslides include damage or destruction of portions of roads and railroads, sewer lines, pipelines, and water lines, electrical and communications distribution lines, and destroyed homes and public buildings, but the most significant effect of landslides is the disruption of transportation and the destruction of private and public property.

The Clark County HIVA indicates the County has a history of landslides and their numbers are increasing, suggesting a high probability of occurrence. Landslides tend to occur in isolated, sparsely developed areas threatening individual structures and remote sections of the transportation, energy and communications infrastructure suggesting low vulnerability. Because of the high probability of occurrence and the trend to more frequent landslides, a moderate risk rating is assigned.

The risk to the water system is considered low because of the lack of steep slopes in the Camas area. Flooding and Earthquakes will increase the risk of landslides. Refer to Tables 5-5 and 5-6 for response measures that may be appropriate for landslides induced by those event categories.

**SEVERE SNOWSTORM**

The most significant anticipated impact of a severe snowstorm is limiting access to the City's facilities. City personnel may not be able to access water mains, reservoirs or valves for maintenance and/or manual operation of system components. During a severe snowstorm the City will rely on the telemetry system for information on the major system components. Additional hazards to be considered with severe winter storms include:

- Freezing in City Reservoirs – Mitigated by ensuring continuous turnover.
- Water service line breaks – Mitigated by asking customers to be vigilant for flooding around homes and businesses.
- Roof Collapse on City buildings and reservoirs – Mitigated by observing snow levels and having City crews remove when snow load may be exceeded.

Table 5-7 lists water system response measures associated with winter storms.

**TABLE 5-7**

**Severe Snowstorm Response City of Camas Water System**

| Water System Component | Potential Effects | Recommended Actions |
|---|---|---|
| Transmission and Distribution System | City staff transportation for monitoring system and making repairs will be limited. | Contact City street department to expedite plowing of critical water system component access. Maintain chains and other snow gear for maintenance equipment on hand. Be able to provide accurate locations of valving for maintenance purposes. |
| Storage Facilities | Snow may prevent access. | Clear snow from access roads. Three 4 x 4 vehicles are available for water department use to access critical sites. |
| Booster Stations | Snow may prevent access. | Clear snow from access roads. Three 4 x 4 vehicles are available for water department use to access critical sites. |
| Wells | Snow may prevent access. | Clear snow from access roads. Three 4 x 4 vehicles are available for water department use to access critical sites. |
| Treatment Facilities | Snow may prevent access. | Clear snow from access roads. Three 4 x 4 vehicles are available for water department use to access critical sites. |

## TORNADO

Tornadoes are characterized by funnel clouds of varying sizes that generate winds as fast as 500 miles per hour. They can affect an area of 1/4 to 3/4 of a mile and seldom more

than 16 miles long. Tornadoes normally descend from the large cumulonimbus clouds that characterize severe thunderstorms. They form when a strong crosswind (sheer) intersects with strong warm updrafts in these clouds causing a slowly spinning vortex to form within a cloud. Eventually, this vortex may develop intensity and then descend to form a funnel cloud. When this funnel cloud touches the ground or gets close enough to the ground to affect the surface it becomes a tornado. Tornadoes can come from lines of cumulonimbus clouds or from a single storm cloud. Tornado hazards are measured using the Fujita Scale ranging from F0 to F6.

A history of tornadoes in Clark County follows:

- October 1951 – Battle Ground (F0 on the Fujita Scale). 8-miles long and 25-yards wide, which uprooted trees and destroyed a two-story barn.

- August 26, 1953 – Ridgefield (F0 on the Fujita Scale). Lasted 3 minutes and severely damaged a farm.

- April 5, 1972 – Vancouver (F3 on the Fujita Scale). This was the most disaster to occur in Clark County and the most serious tornado in Washington State. Six people died and 300 were injured when a tornado cut a swath of destruction through East Vancouver. The tornado's path was 9-miles long, from the Columbia River, just east of Andresen Road up to Fourth Plain Blvd. Peter S. Ogden Elementary, a shopping center, and a bowling alley were severely damaged.

- December 1974 – Camas (F0 on the Fujita Scale). Windows were broken and walls collapsed but there was no serious damage.

- October 1984 – Woodland (F1 on the Fujita Scale). A funnel cloud touched down several times, snapping and overturning trees, and ripping up fence lines. A barn roof was torn off, corrals flattened and a pump house lifted and exploded.

- June 29, 1989 – La Center (F1 on the Fujita Scale). Uprooted several trees and tossed one car off the road causing minor injuries to the driver.

- May 31, 1997 – Vancouver (F0 on the Fujita Scale). Caused $10,000 in property damage.

- September 15, 1997 – Yacolt (F0 on the Fujita Scale). No reported damage.

- May 11, 2000 – Battleground (F0 on the Fujita Scale). Caused $10,000 in property damage.

- May 27, 2004 – La Center (F0 on the Fujita Scale). No reported damage.

- September 2004 – Ridgefield (F0 on the Fujita Scale). No reported damage.

- January 10, 2008 – Vancouver, (F1 on the Fujita Scale). Damage reports showed widespread downed power lines, malfunctioning traffic lights, and roofing that had been ripped off. Although the majority of damage was light in nature, in at least one case a home was completely demolished. At least 2,500 homes and businesses had lost power because of the storm. Property damage estimated to total $525,000.

- December 2015 – Battle Ground (F1 on the Fujita Scale). Damage reports showed downed power lines, malfunctioning traffic lights, damaged fences and roofing that had been ripped off. Although the majority of damage was light in nature, two businesses were damaged and deemed to be unsafe. No injuries were reported.

Table 5-8 provides definitions of tornado hazards.

**TABLE 5-8**

**Tornado Hazard Scale**

| F-Scale Number | Intensity Phase | Wind Speed | Type of Damage Done |
|---|---|---|---|
| F0 | Gale Tornado | 40-72 mph | Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards. |
| F1 | Moderate Tornado | 73-112 mph | The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed. |
| F2 | Significant Tornado | 113-157 mph | Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated. |
| F3 | Severe Tornado | 158-206 mph | Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted. |

Tornadoes are not normal occurrence in the Northwest as they require a confluence of warm surface temperatures and warm fronts coming from the south with cold fronts coming from the north. Northwest climates do not normally generate the temperature variations conducive to tornado formation. Washington is ranked 43 in the US for total number of tornadoes. Nonetheless, CRESA states that the tornado threat should be taken very seriously. The conditions conducive to tornado formation may develop in Southwest

Washington and it is common for funnel clouds to be reported in this region. During severe thunderstorms it is possible for tornadoes to occur.

With the exception of the April 1972 disaster, tornadoes in Washington and Oregon tend to be light or moderate, with winds ranging from 40 to 112 mph. There are a notable minority of tornadoes that cause significant to severe damage with winds going as high as 200 mph. The peak season for tornadoes is April through July. However, in Washington tornadoes may occur in the late summer months and, in a few rare cases, may occur in the winter months. While tornadoes are sometimes formed in association with large Pacific storms, most of them are caused by intense local thunderstorms. Tornadoes almost exclusively occur in the late afternoon and early evening.

It is possible for a tornado to occur anywhere in the lower elevations of Clark County. Normally, Pacific Northwest tornadoes are moderate but it is possible for serious tornadoes to develop, causing death and serious injury as well as property damage.

Water systems most vulnerable to tornadoes will be reservoirs, booster stations and treatment facilities. Reservoirs are not designed to withstand the high winds possible with tornadoes and buildings that house well pumps, booster pumps and treatment facilities may be damaged or destroyed by a severe tornado.

**VOLCANO**

According to the Clark County HIVA, the most likely scenarios for volcanic eruptions that will impact the County are as follows:

- Ashfall and *tephra* (the ash, rock and boulder-sized debris from an exploding volcano) from Mt. St. Helens.

- Ashfall and the generation of *lahars* (volcanic mud/debris flows) from the Sandy River in Oregon due to volcanic activity at Mt. Hood.

The most severe impacts in Southwest Washington from another major eruption from Mt. St. Helens eruption would be in Cowlitz County. In this event, Clark County emergency managers and responders may support Cowlitz County agencies and the Forest Service in assisting in evacuation, perimeter control, search and rescue and other operations. Drawing from these resources may leave the City of Camas potentially vulnerable to an inability to respond should emergencies arise that require local response assets.

The vulnerability to damage from lahars is greatest in southern Clark County, due to potential impacts from lahars in the Sandy River. Since the Sandy River empties into the Columbia across from Camas, lahar deposits could influence the flow of the Columbia River and possibly affect low lying areas of Camas near the Columbia. However, the potential exists for ashfall from volcanic activity to impact the entire county by creating a

respiratory hazard and potentially adding weight to the roofs of City facilities (including the water reservoirs) that will increase significantly if it becomes wet. Wet ash also creates a slipping hazard and will create traffic problems and make water system maintenance hazardous.

**URBAN FIRE**

In the 2019 Water System Plan, a hydraulic analysis was conducted in several areas throughout the system to determine if the water system had adequate capacity to provide fire flow. Deficiencies were noted in the following areas:

- PRV Systems – Lacking pressure-sustaining features to prevent fire flows in lower pressure zones from causing unacceptable service pressures in upper pressure zones.
- West of Fargo (19$^{th}$ thru 22 Ave) – Fire flow limitations.
- Various pockets in Downtown – Fire flow limitations.
- Pacific Rim Blvd near Parker Street – Fire Flow limitations

The modeling of the water system is generally based on single event structural fires. In addition to the areas with fire flow deficiencies noted above, multiple structural fires occurring simultaneously in the same pressure zone could conceivably overwhelm the water system's capacity. If mutual aid agreements are invoked, the City would need to consider the potential for a water shortage in a coordinated fire response.

However, in the event of a fire City personnel monitor reservoir levels and system performance with the telemetry system, which allows the Fire Department to understand the limitations of water supplies available for fire suppression and to operate accordingly. It is also important to note that the City's Municipal Code also requires that all buildings, including residential structures, are required to be sprinklered, which significantly reduces the potential for large structure fires.

Other issues to consider with fires include:

- Creating a vacuum on waterlines due to high fire demand; this may create a cross-contamination hazard.
- Water quality complaints from customers due to high pipe velocities scouring inner pipe surfaces.

Table 5-9 lists water system response measures for urban fires.

**TABLE 5-9**

**Urban Fire Response City of Camas Water System**

| Water System Component | Potential Effects | Recommended Actions |
|---|---|---|
| Transmission and Distribution System | Low pressure may result in the extremities of the system depending on the extent of the fire incident. | Monitor system and adjust pumps if applicable. |
| Storage Facilities | Draw down will occur in the reservoirs with increased demand. | Monitor reservoir levels. |
| Booster Stations | Additional pumps called on. | Monitor pump station to ensure proper operation. |
| Treatment Facilities | Fire in watershed could cause increased sediment in the surface water source. Turbidity levels may exceed acceptable levels. | Use groundwater sources until surface water sources available. Provide silt fences along areas that have lost vegetation due to fire. Contact DOH. |

**POWER FAILURE**

Various types of severe weather can cause loss of electrical power. In order to alleviate the effects of a power outage, the City has installed auxiliary generators at the Chlorination Plant, the Filter Plant, Butler/Gregg Booster Stations, Angelo Booster Station, Lacamas Booster Station and the Lower Prune Hill Pump Station. Well Nos. 8, 11 and 12 also have an auxiliary power source to allow the wells to operate during an electrical outage. The Washougal Wellfield Treatment Facility obtains auxiliary power from the generator for Wells 11 and 12.

Table 5-10 presents the potential effects of a lengthy power failure on the water system components.

**TABLE 5-10**

**Power Failure Response City of Camas Water System**

| Water System Component | Potential Effects | Recommended Actions |
|---|---|---|
| Transmission and Distribution System | No effect | None. |
| Storage Facilities | Telemetry system may be inoperable. | Manually check reservoir levels. Some reservoirs can provide water to lower areas. |
| Booster Stations | Booster stations inoperable without auxiliary power. | Operate booster station with auxiliary power. |
| Wells | Unable to supply additional water to system. | Well Nos. 8, 11 and 12 Auxiliary Power |
| Treatment Facilities | | Auxiliary generator. |

## DAM FAILURE

Dam failures are the release of impounded water due to structural deficiencies, which can affect lives and property downstream. Dam failures are caused by flooding, earthquakes, lack of maintenance and repair, misoperation, poor construction, vandalism, or terrorism.

According to the Clark County HIVA, several dam failures have occurred in Washington State over the last 40 years, some of which been catastrophic, but none have occurred in or has impacted Clark County.

There are 36 dams in Clark County. These dams are used for hydroelectric power generation, irrigation, and recreation. Table 5-11 shows dams that could potentially impact the City of Camas.

## TABLE 5-11

## Clark County Dams Upstream of the City of Camas

| Name of Dam | Year Built | Type | Nearest City Downstream | Distance in Miles | River | Downstream Hazard Category |
|---|---|---|---|---|---|---|
| Clark Reservoir Dam | 1948 | RE | Camas | 4 | Robinson Creek | 3 |
| Lacamas and Round Lakes, Lower Dam | 1936 | BU | Camas | 1 | Lacamas Creek | 2 |
| Lacamas and Round Lakes, Upper Dam | 1936 | BU | Camas | 1 | Lacamas Creek | 2 |
| Price Reservoir Dam | 1950 | RE | Camas | 3 | Tributary - Lacamas Creek | 3 |

Dam Type: BU – Buttressed Dam, RE – Reinforced Earth Dam.
Hazard Category:
1 = High; 2 = Significant; 3 = Low
(reference: Washington State Department of Ecology Dam Safety Guidelines, July 1992, revised Sept 2004)
2 = 1 to 6 lives at risk, appreciable economic loss, limited or short term water quality degradation
3 = No lives at risk, minimal economic losses, no significant water quality impacts

Washington State uses a Downstream Hazard Classification system for dams, which assigns a Low, Significant or High rating for populations at risk of economic loss and environmental damage should the dam fail. In Clark County, most dams are rated low, three are significant and three high. (The three potential high hazard dams are the Merwin Dam on the Lewis River, Erickson on Rock Creek and Tsugawa Brothers Reservoir Dam on Mason Creek.) The three potential significant hazard dams are the Elmer Dam on Mason Creek and the Lacamas and Round Lakes, upper and lower dams on Lacamas Creek; these latter two dams pose a downstream hazard to the City of Camas.

In addition to the dams located in Clark County, the county can also be affected by dam failures of dams on the Columbia River upstream from Clark County. CRESA considers these dams to be well maintained, operated with 24-hour staffing and inspected on a regular basis.

CRESA states that Washington experiences a dam failure on a frequency of approximately once every two years. The majorities of failures were in whole or part the result of a failure to perform adequate maintenance and monitoring of the facilities. Dam failure can have many effects such as loss of life, damage to structures, roads, utilities, and crops. Economic losses can also result from a lowered tax base and lack of power profits.

History suggests a low probability of occurrence. The failure of a high hazard dam would threaten a small segment of the County suggesting low vulnerability. Because there has not been a major dam failure in Clark County, and the three high hazard dams are well

maintained and operated providing no reason to suspect a compromise in structural integrity baring a natural disaster or terrorist action, a low risk rating is assigned.

For response measures in the event of a dam failure, refer to Table 5-7 (flood response).

## TRANSPORTATION ACCIDENT (AIRPLANE CRASH)

Although there have been no major airplane crashes in Clark County, the scope of the impact of such an event and the potential complexities of the response require the City to consider how such an incident could impact the water system operation.

The City of Vancouver is across the river from Portland International Airport. The airspace over the Columbia River and Vancouver is heavily used by all types of aircraft flying into Pearson Airpark, Portland Air National Guard Base and Portland International Airport. Most airplane accidents occur during arrival and departure so the City of Vancouver is at a greater risk than any other area in the County. Considering the flight paths of aircraft into and out of Portland International Airport, Vancouver has the potential for a major airplane crash with mass casualties, hazardous materials incidents, and fires. Accordingly, response assets from the City of Camas may be drawn to a crash site and leave the City potentially vulnerable if another emergency arises that requires those assets. Additionally, an airplane crash could cause major transportation routes to be closed for significant periods of time, resulting in significant delays for contractors, equipment and chemical suppliers to access the City of Camas.

## TRANSPORTATION ACCIDENT (HIGHWAY OR RAIL)

City water lines cross a number of well-trafficked thoroughfares through the City, including SR 14 and the railroad that runs parallel to SR14. It is conceivable that a major accident on one of these thoroughfares would damage a water line. The Public Works component of the response to a transportation incident includes the following:

- Coordinate damage assessments, emergency road clearing and road repair activities
- Provide contracts for repair and recover work, including damaged utilities
- Provide maps for transportation route planning

The water utility will need to be assessed rapidly in the event of a major transportation incident to determine if water lines have either been damaged or are at risk of being damaged due to the incident. It may become necessary to isolate damaged or at-risk water lines until the incident has been cleared and emergency repairs have been made to allow recovery efforts to proceed.

## HAZARDOUS MATERIALS (HAZMAT) INCIDENT

According to the Clark County HIVA, as of 1998, Clark County had approximately 77 entities, at 117 facility locations, which filed an Emergency and Hazardous Chemical Inventory Form (known as a Tier Two Form) with Washington State Department of Ecology. Of these 117 facilities about 58 of them use chemicals on the Environmental Protection Agencies list of Extremely Hazardous Substances.

The City may obtain Clark County Tier Two Hazardous Chemical Inventories from CRESA:

Phone: (360) 737-1911 Email: cresa@clark.wa.gov

Statistics show that nearly half of all hazardous materials incidents occur during transit. Large quantities of HAZMAT are transported through and in the close vicinity of the City via the interstate highway and by rail. In the event of a HAZMAT spill, the Fire Department will be the City's lead department for incident response within the City limits. A large spill will trigger the need for mutual response under the Regional HAZMAT response agreement.

The City of Camas Fire Department has no HAZMAT response capability. A HAZMAT response capability permits offensive operations necessary to perform the following operations:

- Preliminary hazard characterization
- Safely enter the hazardous area
- Mitigate the effects of the release prior to recovery operations
- Exit the hazard area employing a deliberate and thorough decontamination process

The above capabilities can only be provided by HAZMAT teams that are equipped and trained to Occupational Safety and Health Agency regulations (29 CFR 1910.120) and National Fire Protection Association competency levels (NFPA 471 and 472). The City of Vancouver and the Georgia Pacific Mill have such response capabilities. The City Fire Department will coordinate all HAZMAT support with this units working with CRESA under the regional HAZMAT response plan. Telephone numbers for the City of Vancouver and Georgia Pacific HAZMAT teams leaders are as follows:

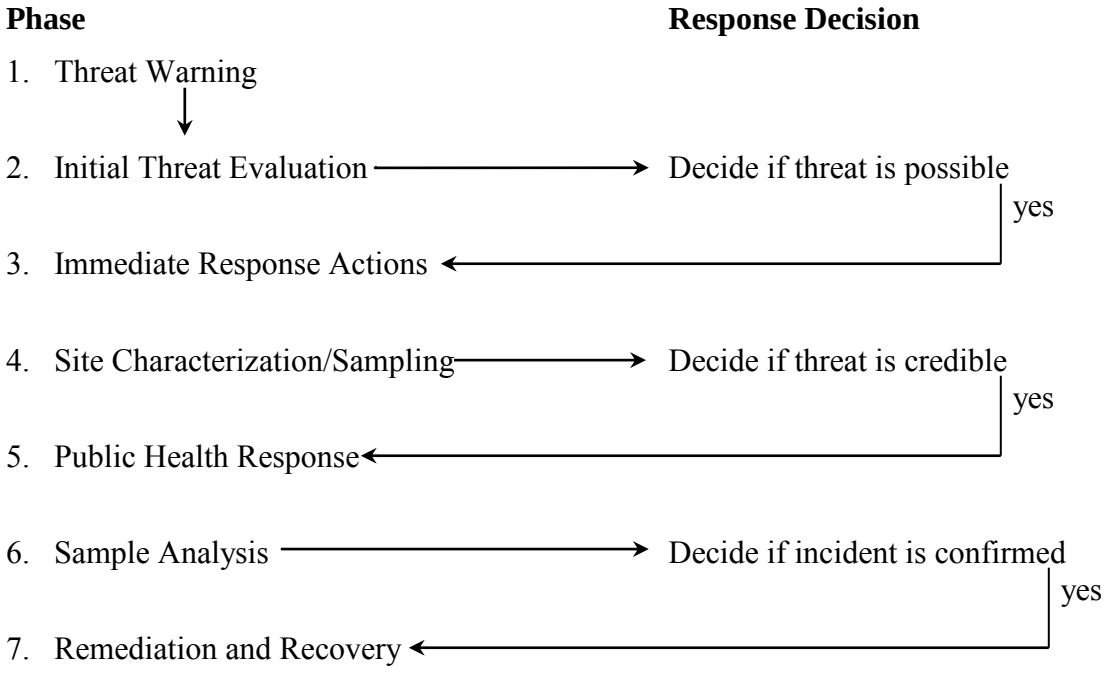
City of Vancouver (360) 619-4165
Georgia Pacific (360) 834-8465

The Public Works and Fire Departments will communicate during a HAZMAT spill to determine if the incident poses a hazard to water system personnel and facilities. It may become necessary to isolate water lines that are at risk of contamination due to a HAZMAT spill in order to prevent contamination of the water system.

**INTENTIONAL CONTAMINATION**

This type of incident could accompany a terrorist incident involving chemical, biological or radiological agents as well as vandalism. It is treated as a unique class of incident due to the complexities of the response from an operational, public health, law enforcement and physical recovery standpoint.

The EPA recommended protocols for managing a suspected intentional contamination incident are summarized in Figure 5-4. The EPA protocol has seven phases with three response decision points:

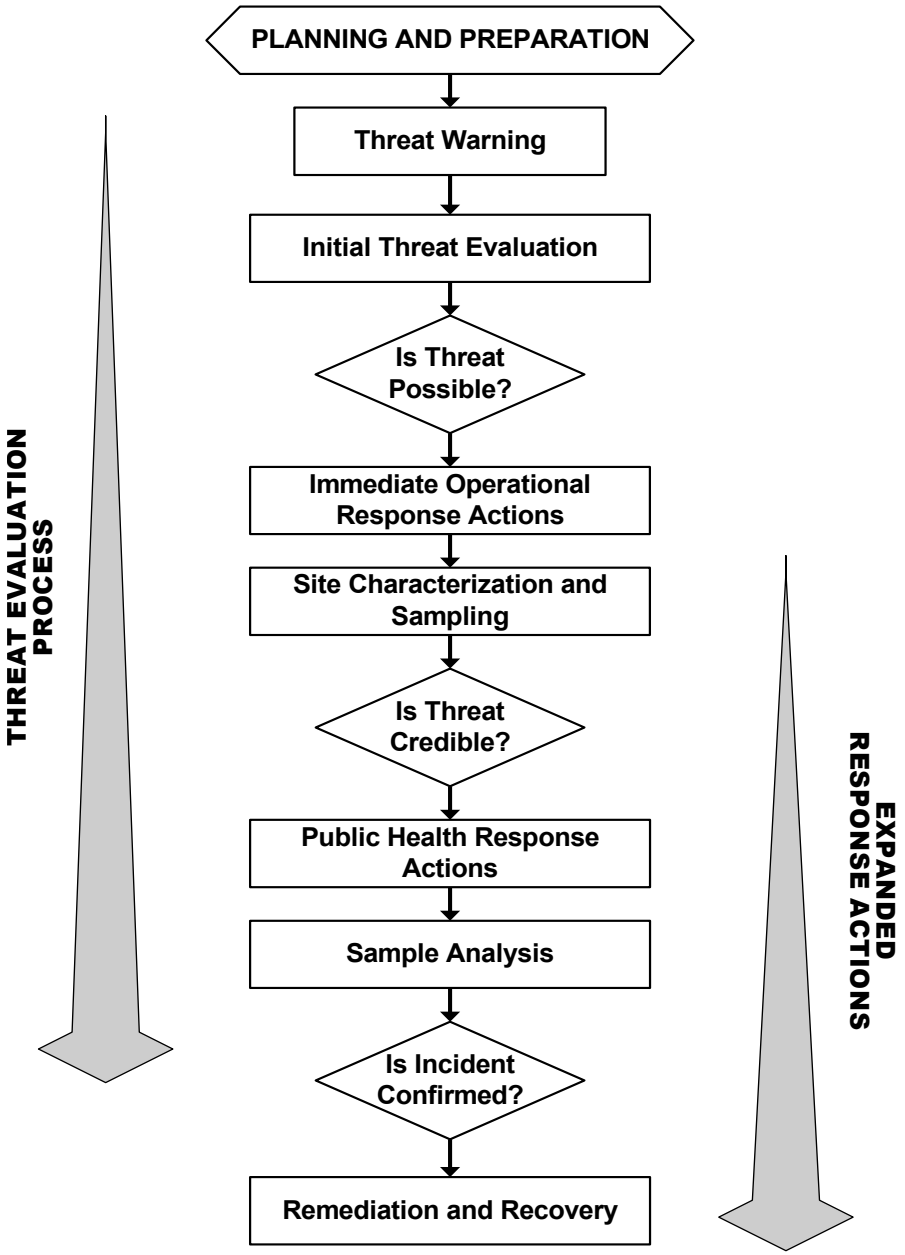



In no case should the utility pursue these actions unilaterally. Jurisdictional law enforcement agencies and public health agencies must be involved in each phase of the process. There are legal and practical requirements for this involvement, including rules of evidence for criminal investigations, balancing the need to protect law-enforcement sensitive information with public-right-to-know provisions in the Safe Drinking Water Act, obtaining specialized technical advice for sampling procedures and protecting the safety and health of water system personnel when taking water samples to test for suspected contamination.

Terrorism is a Federal crime and will require the involvement of federal law enforcement (Federal Bureau of Investigation).

**FIGURE 5-4**

**Protocol for Managing an Intentional Contamination Incident**




Reference: Planning for and Responding to Drinking Water Contamination Threats and Incidents Response Protocol Toolbox, USEPA, December 12, 2003.

Additionally, it is always recommended that the water utility consult with the HAZMAT team leader during the characterization and sampling process since, depending on the exposure hazard, it may become necessary for HAZMAT technician trained personnel to perform the site assessment and collect samples wearing OSHA compliant personal protective equipment.

**Threat Warning**

This is any unusual occurrence, observation, or discovery that indicates a potential contamination incident and initiates actions to address this concern. Such a warning would typically come in the form of an apparent security breach in the water system. Evidence of a security breach could come in the form of a telephone call threatening contamination or stating that intentional contamination has occurred; statements by witnesses who have seen water facilities being tampered with or broken into; physical evidence at a water facility indicating water facilities have been intentionally damaged or tampered with; and reports of increased illnesses from local hospitals or the Clark County Health Department.

**Initial Threat Evaluation**

This is the part of the threat management process in which all available and relevant information about the threat is evaluated to determine if the threat is possible. This is an iterative process in which the threat evaluation is revised as additional information becomes available. The conclusions from the threat evaluation are considered when making *response decisions*.

**Immediate Response Actions**

These are actions taken in response to a possible contamination threat in an attempt to minimize the potential for exposure to the potentially contaminated water. Immediate operational response actions will generally have a negligible impact on consumers. These actions will include estimating the potential area(s) within the water system that may have been subject to contamination and isolating these areas from the system to contain the contamination. This process must be performed quickly and generally will not allow modeling tools to be used unless the scenarios have been developed and modeled prior to the suspected contamination event.

**Immediate Characterization and Sampling**

This is the process of collecting information from an *investigation site* in order to support the evaluation of a drinking water contamination threat. Site characterization activities include the site investigation, *field safety screening*, *rapid field testing* of the water, and sample collection.

Field Safety Screening

Screening performed to detect any environmental hazards (i.e., in the air and on surfaces) that might pose a threat to the *site characterization* team. Monitoring for radioactivity as the team approaches the site is an example of field safety screening.

Rapid Field Testing

Analysis of water during *site characterization* using rapid field water testing technology in an attempt to tentatively identify contaminants or unusual water quality.

**Public Health Response**

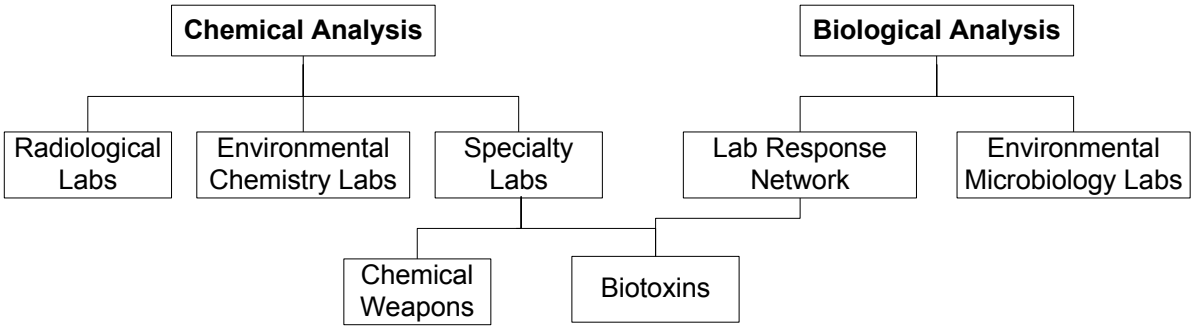
This encompasses all actions taken to mitigate consequences resulting from threats or incidents involving biological, chemical, or radiological contaminants. These actions include public notification, using an alternative water supply, boil water notices and chemical sterilization.

**Sample Analysis**

This step involves laboratory analysis that is undertaken to confirm the presence/absence of contamination such that specific decisions can be made by law enforcement and public health officials and allow the water utility to proceed with definitive response and recovery actions. It is important to keep in mind that not all labs can definitively confirm a potential contamination agent. Figure 5-5 shows the types of laboratories and their general capabilities.

**FIGURE 5-5**

**Types of Laboratories by Contaminant Class**




Reference: Planning for and Responding to Drinking Water Contamination Threats and Incidents Response Protocol Toolbox, Module 4: Analytical Guide, USEPA, December 12, 2003

Definitions for terms used in Figure 5-5 are provided below. The EPA Environmental Laboratory Compendium provides a national listing of laboratories and their capabilities. The City may sign up for this list by going to the EPA's water security website:

http://cfpub.epa.gov/safewater/watersecurity/index.cfm

Environmental Chemistry Laboratory

This is any laboratory, either commercial or government-operated that is able to perform analysis of water samples for compliance with the Safe Drinking Water, Clean Water Acts, or other applicable environmental regulation, as well as other chemical parameters that are important to system operation and overall water quality. These laboratories have the instrumentation necessary to implement methods for chemical analysis of a water sample.

Environmental chemistry laboratories perform water analyses to support regulatory compliance and they are familiar with the need to treat samples with precautions necessary for legal defensibility. Analysis for regulatory compliance purposes, however, may proceed differently than analysis of emergency samples in response to a contamination threat, which has the dual role of both providing an emergency response to protect public health and also providing legally defensible evidence to support a criminal investigation. Additionally, no commercial environmental chemistry laboratories can analyze chemical warfare agents (e.g., nerve, mustard and blood/choking agents); this latter type of analysis can only be performed by a small number of government-operated laboratories in the United States whose access is restricted to law enforcement and military agencies.

Environmental Microbiological Labs

These labs include those of EPA, state environmental agencies, and the commercial sector, that typically perform analyses for waterborne pathogens. Most of these laboratories have the equipment and staff necessary to analyze for indicators of fecal contamination such as fecal and total coliforms and *E. coli*. Culture techniques are available for many of the more common waterborne pathogens such as *Vibrio cholerae, Salmonella enteriditis,* Typhi, and *Shigella* spp.; however, analyses for these pathogens are not routinely performed in most environmental microbiological laboratories. While some environmental microbiological laboratories have expanded capabilities to analyze for parasites such as *Cryptosporidium* and *Giardia* or to perform molecular assays for some organisms, these capabilities are not widespread.

Only laboratories registered for the analysis of select agents are legally permitted to analyze for those agents, and currently most registered labs reside in the LRN. Thus, even if environmental microbiological laboratories develop additional capabilities for

pathogen analysis, they could not perform such analyses without registering for select agents.

Laboratory Response Network (LRN)

This is a network of laboratories developed by the Centers for Disease Control (CDC), Association of Public Health Laboratories (APHL), and the Federal Bureau of Investigation (FBI) for the express purpose of dealing with bioterrorism threats, including pathogens and some biotoxins.

Radiological Labs

These laboratories specialize in the analysis and handling of radiological materials. For radionuclides, analytical confirmation may be viewed differently than most chemicals because radionuclide analysis can take the form of screens for gross alpha, beta, or gamma radiation, and/or it can take the form of analysis for the specific radionuclides themselves, such as strontium-90. Thus, analytical confirmation may involve the process of confirming quantity of gross radiation or identifying the radionuclide. The type of analysis that is performed will be based on the analytical goals. For example, radionuclides in drinking water regulation are often characterized by their gross alpha and gross beta emissions.

For the purpose of emergency analysis of water contaminants, a tiered approach is suggested, with screening for gross radiation in the field or upon receipt by the laboratory followed by identification of the radionuclide, which may be important for a more complete understanding of risks to public health as well as potential criminal actions against perpetrators.

Specialty Labs

These are laboratories that are capable of analyzing samples for chemical, biological and radiological agents that cannot be analyzed by commercial laboratories. These labs require special safety certifications for operation and their access is controlled by law enforcement agencies and the military.

**Remediation and Recovery**

The remediation process involves: system characterization; selection of remedy options; provision of an alternate drinking water supply during remediation; and monitoring to demonstrate that the system has been remediated. This process will follow a process similar to the US EPA's Superfund program's approach to hazardous waste site cleanup to include *risk assessment*, *system characterization*, *feasibility study*, analysis of alternatives, *remedy* selection, *remedial design*, *remedial action*, and post-remedial monitoring and operations.

**EXPLOSIVES INCIDENT**

A bomb threat will be handled by the City Police Department. If the call is received at the CRESA 911 call center, the call center staff is trained regarding information to be obtained and questioning techniques. If the call is received by a City employee they will follow procedures as shown in Appendix L.

In the event of an attack on the water system with explosive devices, the response will, like a contamination incident, be complex and multidisciplinary (police, fire, public works, emergency medical services (EMS), public information, etc.). Important issues to be considered in the response include:

- Assignment of the Incident Commander (will depend on the situation/risks) – the incident commander is responsible for overall command and control at the incident scene and the health and safety of all response personnel.

- Presence of casualties and proper procedures for casualty extraction and emergency medical treatment at the incident site.

- The risk of fire/explosion presented by flammable materials in the vicinity of the explosion.

- Threat of a secondary device (a device that is placed at the scene to kill or injure emergency responders after their arrival).

- Physical hazards associated with collapsed structures.

- Evidence preservation requirements.

- Respiratory, ocular and skin hazards associated with vapors and fine particulate matter generated by the explosion and subsequent fires and what personal protective equipment (PPE) levels are appropriate for the hazards – note that "escape" respirators (e.g., Quickmask 2000), are <u>not</u> designed for prolonged exposures necessary for intentional entry into a hazardous area, they are designed solely to allow movement away from the incident site to a safer location. Additionally, as of late 2004, no escape masks have received federal certification (the approval agency is NIOSH – National Institute of Occupational Safety and Health) for an independently recognized and tested level of performance.

- The need to maintain communication between all response units (especially police, fire, public works and EMS) to ensure different response units all have the same hazard assessment and understand which

response units are being allowed at the incident site, their locations and basic tasks; this becomes even more critical as mutual aid from other agencies and jurisdictions arrive at the site.

- The need to isolate damaged elements of the water system to make emergency repairs and minimize impact to undamaged elements of the water system.

- The need to maintain a single spokesperson for the City to release information to the public and the news media.

## CYBER ATTACK

The City maintains an IT network separate from the water system SCADA network. The network is used for intracity business and is password protected. Firewall protection is used and no outside access for third parties is allowed.

If a cyber attack is successful, the response will require the IT-System Administrator to assess the extent of impact and develop a plan to restore damaged or compromised files and attempt to recover lost files.

If the SCADA system is compromised it will become necessary to monitor the water facilities by periodic and direct visual contact until the system is restored to normal operations.

## DOCUMENTATION PROCEDURES

During an emergency, precise documentation of actions taken and materials used will greatly increase the efficiency with which the City handles the situation. Detailed recording and reporting of events, such as shut downs, valve isolations, sampling events and reservoir operations, enables repairs to be made quickly keeping down time to a minimum. The detailed reports are invaluable in making certain that the system is quickly and efficiently returned to pre-emergency operating status. To aid employees, an Operating and Damage Report form is included in Appendix M.

The Federal Emergency Management Agency (FEMA) requires proper documentation of damage for the City to file claims in the event the City is covered by a Presidential Disaster Declaration. Photographic evidence of “before” and “after” an event as well as equipment purchase records will strengthen any justification for compensation from the Federal government.

The FEMA disaster assistance website for public agencies can be consulted for further information:

http://www.disasterassistance.gov/daip_en.portal

LIST OF TABLES

# APPENDIX F – WATER FACILITY INVENTORY

# WATER FACILITIES INVENTORY (WFI) FORM

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

ONE FORM PER SYSTEM

Quarter: 1
Updated: 11/16/2018
Printed: 4/26/2019
WFI Printed For: On-Demand
Submission Reason: Source Update

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822

| 1. SYSTEM ID NO. | 2. SYSTEM NAME | 3. COUNTY | 4. GROUP | 5. TYPE |
|---|---|---|---|---|
| 10800 2 | CAMAS MUNICIPAL WATER SEWER SYSTEM | CLARK | A | Comm |

| 6. PRIMARY CONTACT NAME & MAILING ADDRESS | 7. OWNER NAME & MAILING ADDRESS | 8. OWNER NUMBER: 000789 |
|---|---|---|
| ALLEN J. NELSON [OPERATIONS SUPV]<br>CURRIE JD YOUTH CAMP<br>1620 SE 8TH AVE<br>CAMAS, WA 98607 | CAMAS, CITY OF<br>STEVE WALL<br>616 NE 4TH AVE<br>CAMAS, WA 98607 | PUBLIC WORKS DIR. |
| **STREET ADDRESS IF DIFFERENT FROM ABOVE** | **STREET ADDRESS IF DIFFERENT FROM ABOVE** | |
| ATTN<br>ADDRESS<br>CITY STATE ZIP | ATTN<br>ADDRESS<br>CITY STATE ZIP | |

| 9. 24 HOUR PRIMARY CONTACT INFORMATION | | 10. OWNER CONTACT INFORMATION | |
|---|---|---|---|
| Primary Contact Daytime Phone: xxx xxx-xxxx | | Owner Daytime Phone: (360) 817-7899 | |
| Primary Contact Mobile/Cell Phone: xxx xxxx-xxxx | | Owner Mobile/Cell Phone: | |
| Primary Contact Evening Phone: xxx xxx-xxxx | | Owner Evening Phone: | |
| Fax: | E-mail: xxxxxxxxxxxxxxxxxxx | Fax: (360) 834-1535 | E-mail: xxxxxxxxxxxxxxxxxxx |

**11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)**

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed
- [ ] Managed Only
- [ ] Owned Only

SMA NAME: _____ SMA Number:

**12. WATER SYSTEM CHARACTERISTICS (mark all that apply)**

- [ ] Agricultural
- [x] Commercial / Business
- [x] Day Care
- [x] Food Service/Food Permit
- [ ] 1,000 or more person event for 2 or more days per year
- [x] Hospital/Clinic
- [x] Industrial
- [x] Licensed Residential Facility
- [x] Lodging
- [x] Recreational / RV Park
- [x] Residential
- [x] School
- [ ] Temporary Farm Worker
- [x] Other (church, fire station, etc.): _____

| 13. WATER SYSTEM OWNERSHIP (mark only one) | | | | 14. STORAGE CAPACITY (gallons) |
|---|---|---|---|---|
| [ ] Association | [ ] County | [ ] Investor | [ ] Special District | |
| [x] City / Town | [ ] Federal | [ ] Private | [ ] State | 8,500,000 |

- SEE NEXT PAGE FOR A COMPLETE LIST OF SOURCES -

# WATER FACILITIES INVENTORY (WFI) FORM - Continued

| 1. SYSTEM ID NO. | 2. SYSTEM NAME | 3. COUNTY | 4. GROUP | 5. TYPE |
|---|---|---|---|---|
| 10800 2 | CAMAS MUNICIPAL WATER SEWER SYSTEM | CLARK | A | Comm |

| 15 | 16 | 17 | 18 | | | | | | | | | 19 | | | 20 | 21 | | | | | | 22 | 23 | 24 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SOURCE NAME | INTERTIE | SOURCE CATEGORY | | | | | | | | | USE | | | | TREATMENT | | | | | | DEPTH | | SOURCE LOCATION | | | |
| Source Number | LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE | INTERTIE SYSTEM ID NUMBER | WELL | WELL FIELD | WELL IN A WELL FIELD | SPRING | SPRING FIELD | SPRING IN SPRINGFIELD | SEA WATER | SURFACE WATER | RANNEY / INF. GALLERY | OTHER | PERMANENT | SEASONAL | EMERGENCY | SOURCE METERED | NONE | CHLORINATION | FILTRATION | FLUORIDATION | IRRADIATION (UV) | OTHER | DEPTH TO FIRST OPEN INTERVAL IN FEET | CAPACITY (GALLONS PER MINUTE) | 1/4, 1/4 SECTION | SECTION NUMBER | TOWNSHIP | RANGE |
| S01 | BOULDER CREEK | | | | | | | | | X | | | | | X | Y | | X | X | X | | | | 500 | SW NE | 04 | 02N | 04E |
| S02 | JONES CREEK | | | | | | | | | X | | | | | X | Y | | X | X | X | | | | 500 | SE SW | 03 | 02N | 04E |
| S06 | DEEP WELL #5 AFP623 | | X | | | | | | | | | | | X | | Y | | X | | X | | | 71 | 600 | SW SE | 12 | 01N | 03E |
| S07 | DEEP WELL #6 AFP624 | | | | X | | | | | | | | X | | | Y | X | | | | | | 85 | 1400 | NE SW | 12 | 01N | 03E |
| S08 | DEEP WELL #7 AFP628 | | | | X | | | | | | | | X | | | Y | X | | | | | | 49 | 950 | NW SW | 12 | 01N | 03E |
| S09 | DEEP WELL #8 AFP629 | | | | X | | | | | | | | X | | | Y | X | | | | | | 44 | 1350 | NW SW | 12 | 01N | 03E |
| S11 | WELL #9 AFP631 16" | | X | | | | | | | | | | | X | | Y | | X | | X | | | 145 | 650 | NE NW | 04 | 01N | 03E |
| S13 | WELL #11 AHM259 | | | | X | | | | | | | | X | | | Y | X | | | | | | 80 | 1200 | NW SW | 12 | 01N | 03E |
| S14 | WELL #12 AHM266 | | | | X | | | | | | | | X | | | Y | X | | | | | | 81 | 1300 | NW SW | 12 | 01N | 03E |
| S15 | WELL #10 AGP495 | | | | X | | | | | | | | X | | | Y | X | | | | | | 82 | 1300 | NW SW | 12 | 01N | 03E |
| S16 | WELL #13 ALL997 | | X | | | | | | | | | | X | | | Y | | X | | X | | | 80 | 1325 | NE SE | 47 | 01N | 03E |
| S17 | WELL #14 BAM409 | | | | X | | | | | | | | X | | | Y | X | | | | | | 58 | 1000 | NE SW | 12 | 01N | 03E |
| S18 | Eastern WF(S07, S17) | | | X | | | | | | | | | X | | | N | | X | | X | | | 58 | 2400 | NW SW | 12 | 01N | 03E |
| S19 | Western WF (S08, 9, 13,14,15) | | | X | | | | | | | | | X | | | N | | X | | X | | | 44 | 6100 | | | 00N | 00E |

# WATER FACILITIES INVENTORY (WFI) FORM - Continued

| 1. SYSTEM ID NO. | 2. SYSTEM NAME | 3. COUNTY | 4. GROUP | 5. TYPE |
|---|---|---|---|---|
| 10800 2 | CAMAS MUNICIPAL WATER SEWER SYSTEM | CLARK | A | Comm |

| | ACTIVE SERVICE CONNECTIONS | DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS | DOH USE ONLY! APPROVED CONNECTIONS |
|---|---|---|---|
| **25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)** | | 7738 | Unspecified |
| A. Full Time Single Family Residences (Occupied 180 days or more per year) | 6830 | | |
| B. Part Time Single Family Residences (Occupied less than 180 days per year) | 0 | | |
| **26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)** | | | |
| A. Apartment Buildings, condos, duplexes, barracks, dorms | 249 | | |
| B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year | 908 | | |
| C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year | 0 | | |
| **27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)** | | | |
| A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units) | 0 | 0 | |
| B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc. | 379 | 379 | |
| **28. TOTAL SERVICE CONNECTIONS** | | 8117 | |

**29. FULL-TIME RESIDENTIAL POPULATION**

A. How many residents are served by this system 180 or more days per year? 23020

| 30. PART-TIME RESIDENTIAL POPULATION | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A. How many part-time residents are present each month? | | | | | | | | | | | | |
| B. How many days per month are they present? | | | | | | | | | | | | |
| **31. TEMPORARY & TRANSIENT USERS** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** |
| A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month? | 1794 | 1482 | 1638 | 1716 | 1716 | 1560 | 1560 | 1716 | 1560 | 1794 | 1482 | 1560 |
| B. How many days per month is water accessible to the public? | 23 | 19 | 21 | 22 | 22 | 20 | 20 | 22 | 20 | 23 | 19 | 20 |
| **32. REGULAR NON-RESIDENTIAL USERS** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** |
| A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month? | 4013 | 4013 | 4013 | 4013 | 4013 | 4013 | 2148 | 2148 | 4013 | 4013 | 4013 | 4013 |
| B. How many days per month are they present? | 20 | 20 | 22 | 21 | 22 | 21 | 21 | 23 | 20 | 23 | 19 | 20 |
| **33. ROUTINE COLIFORM SCHEDULE** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** |
| * Requirement is exception from WAC 246-290 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

| 34. NITRATE SCHEDULE | QUARTERLY | ANNUALLY | ONCE EVERY 3 YEARS |
|---|---|---|---|
| (One Sample per source by time period) | | | |

**35. Reason for Submitting WFI:**

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

**36. I certify that the information stated on this WFI form is correct to the best of my knowledge.**

**SIGNATURE:** _____ **DATE:** _____

**PRINT NAME:** _____ **TITLE:** _____

| WS ID | WS Name |
|---|---|
| 10800 | CAMAS MUNICIPAL WATER SEWER SYSTEM |

**Total WFI Printed: 1**

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

## *Water Facilities Inventory (WFI)*

| | | | |
|---|---|---|---|
| **Report Create Date:** | 4/26/2019 | | |
| **Water System Id(s):** | 108002 | | |
| **Print Data on Distribution Page:** | ALL | | |
| **Print Copies For:** | DOH Copy | | |
| **Water System Name:** | ALL | | |
| **County:** | -- Any -- | | |
| **Region:** | ALL | | |
| **Group:** | ALL | | |
| **Type:** | ALL | | |
| **Permit Renewal Quarter:** | ALL | | |
| **Water System Is New:** | ALL | | |
| **Water System Status:** | ALL | | |
| **Water Status Date From:** | ALL | **To:** | ALL |
| **Water System Update Date From:** | ALL | **To:** | ALL |
| **Owner Number:** | ALL | | |
| **SMA Number:** | ALL | | |
| **SMA Name:** | ALL | | |
| **Active Connection Count From:** | ALL | **To:** | ALL |
| **Approved Connection Count From:** | ALL | **To:** | ALL |
| **Full-Time Population From:** | ALL | **To:** | ALL |
| **Water System Expanding Services:** | ALL | | |
| **Source Type:** | ALL | | |
| **Source Use:** | ALL | | |
| **WFI Printed For:** | On-Demand | | |

# APPENDIX G – WATER RIGHT DOCUMENTATION

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION

# WATER RIGHT CLAIM

RECEIVED
DEPT. OF ECOLOGY
JUL 17 1974 132272
NUMBER NONE

1. NAME CITY OF CAMAS, WASHINGTON

ADDRESS 616 N.E. 4th Avenue

Camas, Washington ZIP CODE 98607

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: Ground (SURFACE OR GROUND WATER)

W.R.I.A. 28 (LEAVE BLANK)

A. IF GROUND WATER, THE SOURCE IS Deep Well No. 1

B. IF SURFACE WATER, THE SOURCE IS

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 900 gpm PRESENTLY USED 900 gpm
(CUBIC FEET PER SECOND OR GALLONS PER MINUTE)

B. ANNUAL QUANTITY CLAIMED 320 PRESENTLY USED Average 300
(ACRE FEET PER YEAR)

C. IF FOR IRRIGATION, ACRES CLAIMED PRESENTLY IRRIGATED

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: All Year

4. DATE OF FIRST PUTTING WATER TO USE: MONTH Unknown YEAR Before 1942

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: 2159 FEET North AND 667 FEET East FROM THE Southwest CORNER OF SECTION 12

BEING WITHIN Southwest quarter OF SECTION 12 T. 1 N., R. 3 E (E. OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, LOT BLOCK OF

Within the City limits of the City of Camas
(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED: Municipal supply

Clark COUNTY Washington

7. PURPOSE(S) FOR WHICH WATER IS USED: Municipal - Domestic Supply

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED:

DO NOT USE THIS SPACE

THE FILING OF A STATEMENT OF CLAIM DOES NOT CONSTITUTE AN ADJUDICATION OF ANY CLAIM TO THE RIGHT TO USE OF WATERS AS BETWEEN THE WATER USE CLAIMANT AND THE STATE OR AS BETWEEN ONE OR MORE WATER USE CLAIMANTS AND ANOTHER OR OTHERS. THIS ACKNOWLEDGEMENT CONSTITUTES RECEIPT FOR THE FILING FEE.

DATE RETURNED THIS HAS BEEN ASSIGNED WATER RIGHT CLAIM REGISTRY NO.

FEB 7 1975 21022

DIRECTOR - DEPARTMENT OF ECOLOGY

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

X CITY OF CAMAS, WASHINGTON

DATE June 11, 1974

IF CLAIM FILED BY DESIGNATED REPRESENTATIVE, PRINT OR TYPE FULL NAME AND MAILING ADDRESS OF AGENT BELOW.

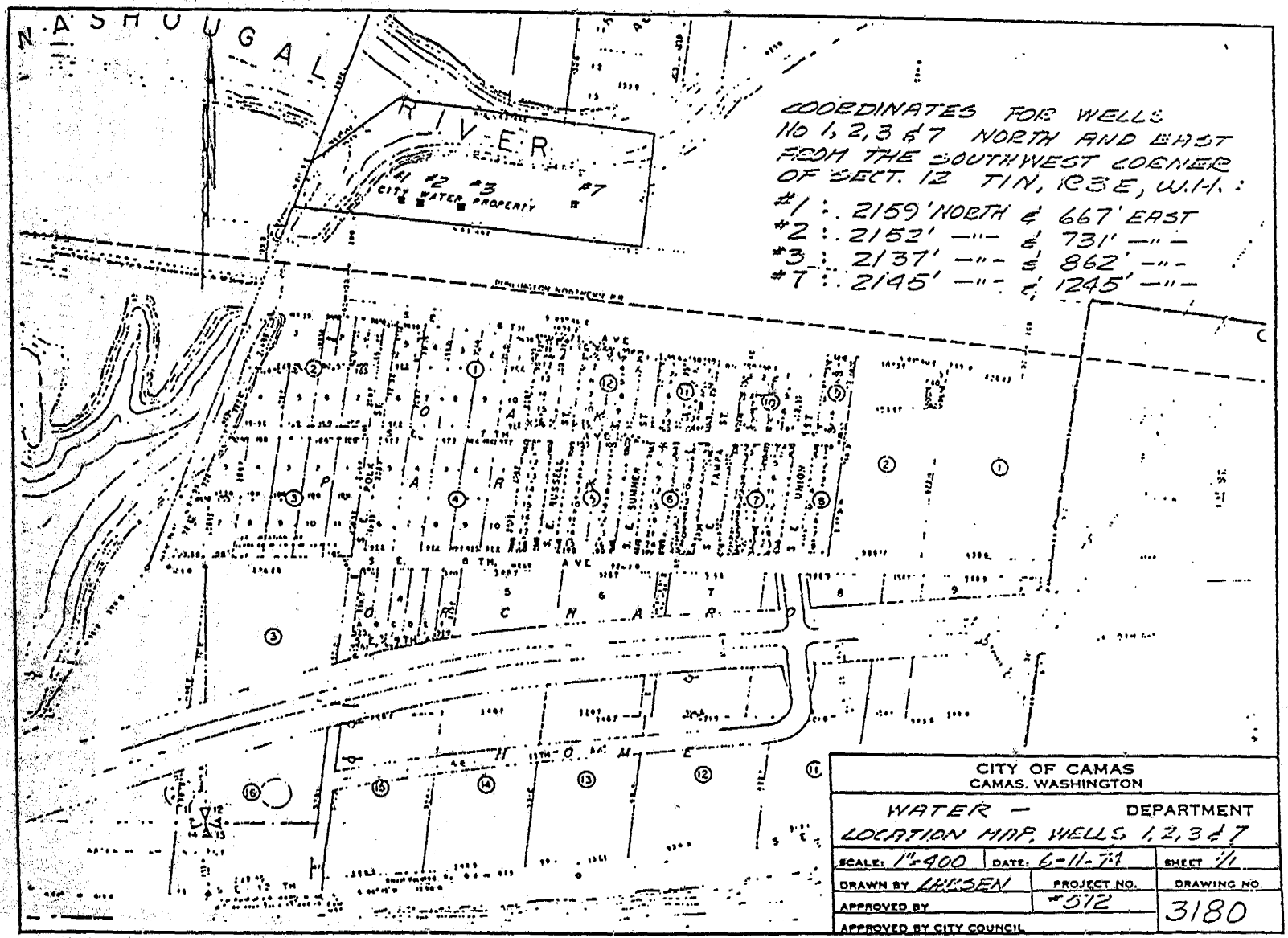
BY: Lewis Angelo
Lewis Angelo, Director of Public Works

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE.

A FEE OF $2.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

ORIGINAL DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT, ALONG WITH YOUR FEE TO:
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION
P.O. BOX 829 OLYMPIA, WASHINGTON 98504


N. ASHOUGAL RIVER
#1 #2 #3 #7
CITY WATER PROPERTY
COORDINATES FOR WELLS
#1, 2, 3 & 7 NORTH AND EAST
FROM THE SOUTHWEST CORNER
OF SECT. 12 T1N, R3E, W.M.:
#1 : 2159' NORTH & 667' EAST
#2 : 2152' —"— & 731' —"—
#3 : 2137' —"— & 862' —"—
#7 : 2145' —"— & 1245' —"—
OAK AVE
BOND
ADAMS
RUSSELL
SUMMER
TAYLOR
UNION
5TH AVE
C H A R
11TH
D A M E
CITY OF CAMAS
CAMAS, WASHINGTON
WATER — DEPARTMENT
LOCATION MAP, WELLS 1, 2, 3 & 7
SCALE: 1"=400
DATE: 6-11-71
SHEET #1
DRAWN BY LARSEN
PROJECT NO. #512
DRAWING NO. 3180
APPROVED BY
APPROVED BY CITY COUNCIL

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION

# WATER RIGHT CLAIM

RECEIVED
DEPARTMENT OF ECOLOGY
JUN 21 1974
132273
CASH ___ CHECK ___ MONEY ORDER ___

1. NAME CITY OF CAMAS, WASHINGTON

ADDRESS 616 N.E. 4th Avenue

Camas, Washington ZIP CODE 98607

2. SOURCE FROM WHICH THE RIGHT TO TAKE AND MAKE USE OF WATER IS CLAIMED: Ground (SURFACE OR GROUND WATER)

W.R.I.A. 28 (LEAVE BLANK)

A. IF GROUND WATER, THE SOURCE IS Deep Well No. 2

B. IF SURFACE WATER, THE SOURCE IS ___

3. THE QUANTITIES OF WATER AND TIMES OF USE CLAIMED:

A. QUANTITY OF WATER CLAIMED 900 gpm PRESENTLY USED 900 gpm
(CUBIC FEET PER SECOND OR GALLONS PER MINUTE)

B. ANNUAL QUANTITY CLAIMED 230 PRESENTLY USED 200
(ACRE FEET PER YEAR)

C. IF FOR IRRIGATION, ACRES CLAIMED ___ PRESENTLY IRRIGATED ___

D. TIME(S) DURING EACH YEAR WHEN WATER IS USED: The months of May through August

4. DATE OF FIRST PUTTING WATER TO USE: MONTH Unknown YEAR Before 1945

5. LOCATION OF THE POINT(S) OF DIVERSION/WITHDRAWAL: 2152 FEET North AND 731 FEET East FROM THE Southwest CORNER OF SECTION 12

BEING WITHIN Southwest quarter OF SECTION 12 T. 1 N., R. 3 E (E.OR W.) W.M.

IF THIS IS WITHIN THE LIMITS OF A RECORDED PLATTED PROPERTY, LOT ___ BLOCK ___ OF
Within the City limits of the City of Camas
(GIVE NAME OF PLAT OR ADDITION)

6. LEGAL DESCRIPTION OF LANDS ON WHICH THE WATER IS USED: Municipal supply

Clark COUNTY Washington

7. PURPOSE(S) FOR WHICH WATER IS USED: Municipal - Domestic Supply

8. THE LEGAL DOCTRINE(S) UPON WHICH THE RIGHT OF CLAIM IS BASED: ___

DO NOT USE THIS SPACE
THE FILING OF A STATEMENT OF CLAIM DOES NOT CONSTITUTE AN ADJUDICATION OF ANY CLAIM TO THE RIGHT TO USE OF WATERS AS BETWEEN THE WATER USE CLAIMANT AND THE STATE OR AS BETWEEN ONE OR MORE WATER USE CLAIMANTS AND ANOTHER OR OTHER PERSONS. NOR DOES IT CONSTITUTE RECEIPT FOR THE FEE UNLESS
DATE RETURNED: THIS HAS BEEN AMENDED BY
WATER RIGHT CLAIM REGISTRATION
FEB 7 1974 24 0 28
DIRECTOR, DEPARTMENT OF ECOLOGY

I HEREBY SWEAR THAT THE ABOVE INFORMATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

X CITY OF CAMAS, WASHINGTON

DATE June 11, 1974

IF CLAIM FILED BY DESIGNATED REPRESENTATIVE, PRINT OR TYPE FULL NAME AND MAILING ADDRESS OF AGENT BELOW.

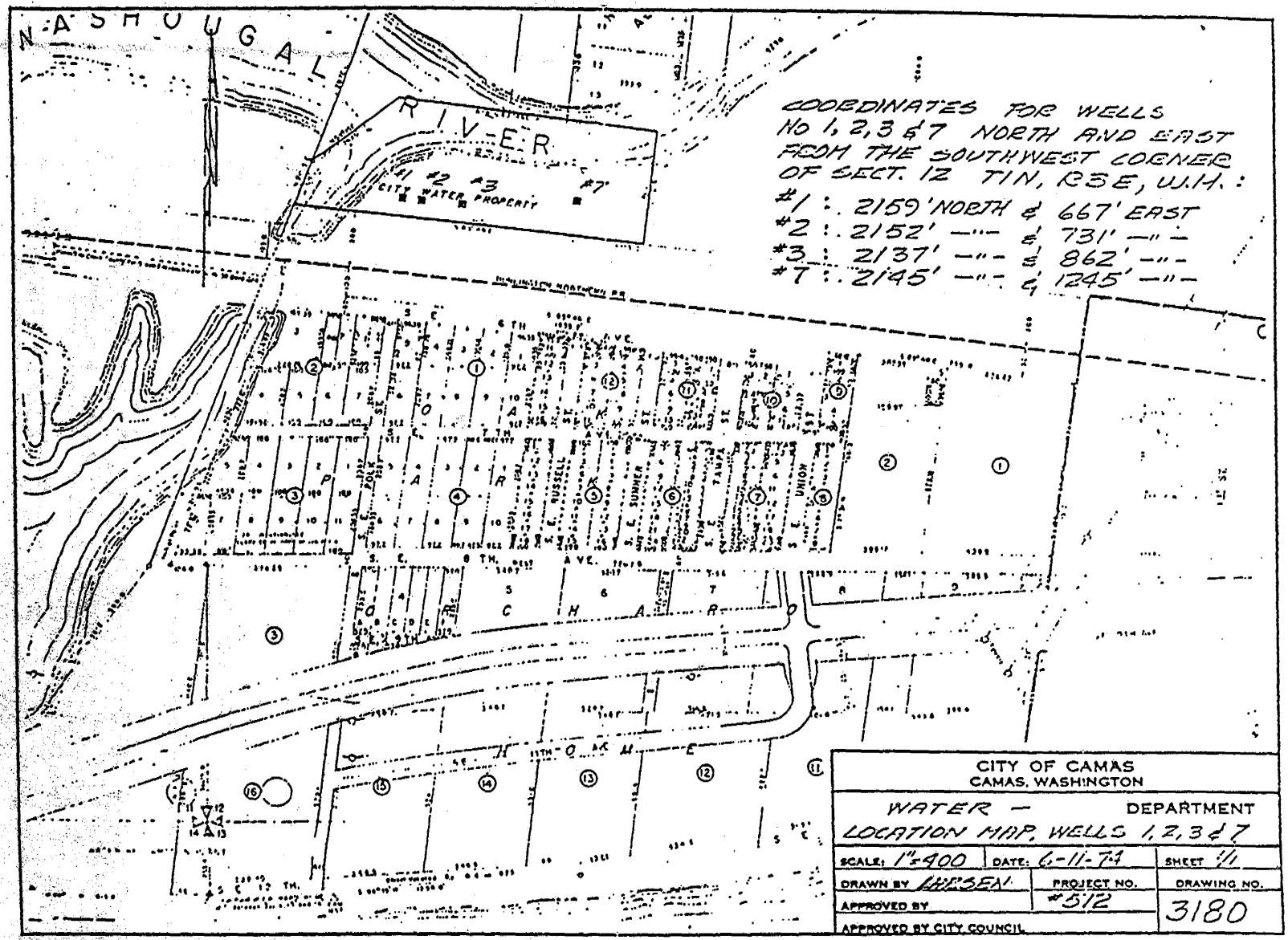
BY: Lewis Angelo
Lewis Angelo, Director of Public Works

☐ ADDITIONAL INFORMATION RELATING TO WATER QUALITY AND/OR WELL CONSTRUCTION IS AVAILABLE.

A FEE OF $7.00 MUST ACCOMPANY THIS WATER RIGHT CLAIM

ORIGINAL DWR

RETURN ALL THREE COPIES WITH CARBONS INTACT, ALONG WITH YOUR FEE TO:
DEPARTMENT OF ECOLOGY
WATER RIGHT CLAIMS REGISTRATION
P.O. BOX 829 OLYMPIA, WASHINGTON 98504


N A S H O U G A L
R I V E R
#1 #2 #3 #7
CITY WATER PROPERTY
COORDINATES FOR WELLS
No 1, 2, 3 & 7 NORTH AND EAST
FROM THE SOUTHWEST CORNER
OF SECT. 12 T1N, R3E, W.M.:
#1 : 2159' NORTH & 667' EAST
#2 : 2152' —"— & 731' —"—
#3 : 2137' —"— & 862' —"—
#7 : 2145' —"— & 1245' —"—
CITY OF CAMAS
CAMAS, WASHINGTON
WATER — DEPARTMENT
LOCATION MAP, WELLS 1, 2, 3 & 7
SCALE: 1"=400
DATE: 6-11-74
SHEET 1/1
DRAWN BY
PROJECT NO. #512
DRAWING NO. 3180
APPROVED BY
APPROVED BY CITY COUNCIL

Form No. 369—1923. Approved as to Form by Dept. of Efficiency. 8509.

CERTIFICATE RECORD NO. 2, PAGE NO. 711

STATE OF WASHINGTON, COUNTY OF Clark

# CERTIFICATE OF WATER RIGHT

(For rights perfected under original, enlargement or secondary permits.)

(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and the regulations of the State Hydraulic Engineer thereunder.)

*This is to certify, that* City of Camas, *of* Camas, *State of* Washington, *has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the waters of* Jones Creek, *a tributary of* Little Washougal River *for the purposes of* domestic supplies, *under* Appropriation *Permit No.* 1575, *of the State Supervisor of Hydraulics, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume* 2, *at Page* 711, *on the* 28th *day of* July, *19*33; *that the right hereby confirmed dates from* September 5th, *19*30; *that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 1.0 *cubic feet per second.*

*A description of the lands under such right, and to which the water hereby confirmed is appurtenant, or if for other purposes, the place where such water is put to beneficial use, is as follows:*

| PLACE OF USE | | | LEGAL SUBDIVISION | [illegible] | [illegible] |
|---|---|---|---|---|---|
| Section | Township | Range | | | |
| | | | City of Camas | | |
| | | | | | |
| | | | | | |

*The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of herein described, except as provided in Section 39, Chapter 117, Session Laws 1917.*

*WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this* 28th *day of* July, *19*33.

Chas. H. Lee

*State Supervisor of Hydraulics.*

ENGINEERING DATA

O.K. [illegible]

NOTICE OF PETITION FOR CHANGE OF
POINT OF DIVERSION OF WATER.

TO WHOM IT MAY CONCERN:

Notice is hereby given that the City of Camas, Clark County, Washington, has filed a petition with the State Supervisor of Hydraulics, Olympia, Washington, for a permit to change the point of diversion of one cubic foot per second of the waters of Jones Creek from a point set out in water right permit 1575 as NW¼ of NW¼ of Sec. 10, Twp. 2 N., Rge. 4 E.W.M., to a point within the SW¼ of SW¼ of Sec. 3, Twp. 2 N., Rge. 4 E.W.M., such point being approximately one-half mile above the point of diversion described in permit, all in Clark County, Wash.

Any person, firm or corporation whose right will be injuriously affected by the granting of said petition may file with the Supervisor of Hydraulics, at Olympia, Washington, such objections or representations, in writing, as he may desire to make within thirty (30) days after the date of last publication, which date is _____.

Witness my hand and official seal this 24th day of April, 1933.

CHAS. J. BARTHOLET
State Supervisor of Hydraulics

PERMIT

*This is to certify that I have examined the foregoing application and do hereby grant the same, subject to the following limitations and conditions.* ~~If for irrigation, this appropriation shall be subject to such reasonable rotation system as may be ordered by the State Supervisor of Hydraulics.~~ And is further subject to rights of C. W. Cottrell under certificate #121, for the appropriation and use of waters of Little Washougal River of which Jones Creek is a tributary.

*The amount of water appropriated shall be limited to the amount which can be applied to beneficial use and not to exceed* 1.0 *cubic feet per second, or its equivalent in case of rotation.*

*The priority date of this permit is* September 5th, 1950.

*Actual construction work shall begin on or before* December 1st, 1951 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before* December 1st, 1952

*Complete application of the water to the proposed use shall be made on or before* December 1st, 1953.

*Given under my hand and the seal of this office at Olympia, Washington, this* 2nd *day of* December, 1950

Chas. J. Bartholomew
*State Supervisor of Hydraulics.*

*Application No.* 3[illegible]6
*Permit No.* 1575

**PERMIT**
**To Appropriate Public Waters of the State of Washington**

*Filed by* City of Camas
*County of* Clark

*This instrument was first received in the office of the State Supervisor of Hydraulics, Olympia, Washington, on the* 5th *day of* September, 19 50, *at* 8:30 *o'clock* A. M.

*Approved* December 2nd, 1950
*Recorded in Book No.* 7 *of Permits, on Page* 1575

CHAS. J. BARTHOLOMEW
*State Supervisor of Hydraulics.*

JAY EMMETT, PUBLIC PRINTER

Before your certificate of water right is issued it will be necessary for you to file with the State Supervisor of Hydraulics a copy of each of the following reports:

1st. Progress reports (in case temporary permit is issued).
2nd. Affidavit of publication of notice of water right application.
3rd. Notice of beginning of construction.
4th. Notice of prosecution of work with diligence.
5th. Notice of completion of construction.
6th. Notice of application of water to a beneficial use.
7th. Proof of appropriation of water.

Upon a satisfactory showing that the appropriation has been perfected as provided by statute the State Supervisor of Hydraulics will issue a water right certificate.

[illegible]-ks will be furnished by the office of State Supervisor of Hydraulics.

APPLICATION NO. 5126

CITY OF CAMAS

Examination made November 3rd & 4th, 1930

This application is for 1.0 c.f.s. for domestic use from Jones Creek a tributary of Washougal River.

November 3rd I talked to Mr. R. C. Sugg, Attorney for Mr. C. W. Cottrell who is making protest against the issuance of permit on this application. He stated he questioned the City of Camas right to Jones Creek but suggested I go over the ground with Mr. Cottrell.

November 4th I went over the ground with Mr. W. H. Barber, City Clerk and Superintendent of Water for City of Camas, also, in reference to application No. 924. Mr. Barber stated that a survey was made in 1925 and this system installed same year from the Little Washougal consisting of two reservoirs on hill above Camas and approximately 11 miles of pipe line. The main from reservoirs to "Y" is of 10 inch steel pipe the portion from "Y" to diversion of Little Washougal is of 8 inch steel pipe. The "Y" was installed for the purpose of diverting a portion of Jones Creek when the city needed the additional water.

There is approximately 6.0 c.f.s. in Jones Creek today.

I then went with Mr. Cottrell over the ground on Washougal River. There is approximately 15.0 c.f.s. in the Little Washougal at the mouth. Mr. Cottrell has a 75 K.W. plant on Washougal River about one-half mile below mouth of Little Washougal which is a part of supply. There is approximately 12.0 c.f.s. going over dam not utilized today.

Mr. Cottrell has another 2 unit hydro plant on Washougal River above mouth of Little Washougal which this application does not affect, it develops 362 K.W. He also has a 340 K.W. Diesel plant at Washougal.

Mr. Barber stated that the water supply from Little Washougal was so inadequate this summer that rigid restrictions were necessary and if they would of had fires the storage supply would have been exhausted.

Mr. Cottrell stated that shortage was experienced only at extreme low water.

The City of Camas has no other means of water supply. A permit should be issued the applicant for 1.0 c.f.s. subject to existing rights.

A. E. Hanson

Signed this 15 day of Nov. 1930.

O.K. for Permit and send to Denver 4/65

Form No. 349—1933. Approved as to Form by Dept. of Efficiency. 8189.

CERTIFICATE RECORD NO. 2, PAGE NO. 712

STATE OF WASHINGTON, COUNTY OF Clark

# CERTIFICATE OF WATER RIGHT

(For rights perfected under original, enlargement or secondary permits.)
(In accordance with the provisions of Chapter 117, Laws of Washington for 1917, and the regulations of the State Hydraulic Engineer thereunder.)

*This is to certify, that* City of Camas, *of* Camas, *State of* Washington, *has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the waters of* Little Washougal River, *a tributary of* Washougal River, *for the purposes of* municipal supply, *under* Appropriation Permit No. 1576, *of the State Supervisor of Hydraulics, and that said right to the use of said waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume* 2, *at Page* 712, *on the* 28th *day of* July, 1933; *that the right hereby confirmed dates from* August 22nd, 19 23; *that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed* 2.5 *cubic feet per second.*

*A description of the lands under such right, and to which the water hereby confirmed is appurtenant, or if for other purposes, the place where such water is put to beneficial use, is as follows:*

| PLACE OF USE | | | LEGAL SUBDIVISION | | |
|---|---|---|---|---|---|
| Section | Township | Range | | | |
| | | | City of Camas | | |
| | | | | | |
| | | | | | |

*The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Section 39, Chapter 117, Session Laws 1917.*

*WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this* 28th *day of* July, 19 33.

Chas. Danckaert
*State Supervisor of Hydraulics.*

PERMIT

STATE OF WASHINGTON, }
COUNTY OF THURSTON. } ss.

*This is to certify that I have examined the foregoing application and do hereby grant the same, subject to the following limitations and conditions.* ~~If for irrigation, this appropriation shall be subject to such reasonable rotation system as may be ordered by the State Hydraulic Engineer.~~ And is further subject to rights of C. W. Cottrell under certificate #121, for the appropriation and use of waters of Little Washougal River of which Jones Creek is a tributary.

*The amount of water appropriated shall be limited to the amount which can be applied to beneficial use and not to exceed* 2½ *cubic feet per second, or its equivalent in case of rotation.*

*The priority date of this permit is* August 22nd, 1923

*Actual construction work shall begin on or before* December 1st, 1931 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before* December 1st, 1932

*Complete application of the water to the proposed use shall be made on or before* December 1st, 1933

*WITNESS my hand this* 2nd *day of* December, *19*30.

Chas. J. Barnhart
*State Hydraulic Engineer.*

This form approved by the State Hydraulic Engineer, 1917.

*Application No.* 924
*Permit No.* 1576

**PERMIT**
To Appropriate the Public Waters of the State of Washington

Issued to City of Camas

*County of* Clark

*This instrument was first received in the office of the State Hydraulic Engineer, Olympia, Washington, on the* 22nd *day of* August, *19*23, *at* 1:45 *o'clock* P. M.

*Returned to applicant for correction*

*Corrected Application received* .....

*Approved* December 2nd, 1930

*Recorded in Book No.* 7 *of Permits, on Page* 1576

CHAS. J. BARNHART
*State Hydraulic Engineer,*

FRANK M. LAMBERT, PUBLIC PRINTER, OLYMPIA

Before your certificate of water right is issued it will be necessary for you to fill out and file with the State Hydraulic Engineer a copy of each of the following reports:

1st. Progress report.
2nd. Notice of water right application.
3rd. Notice to begin construction.
4th. Notice of prosecution of work with diligence.
5th. Notice of completion of construction.
6th. Notice of application of water to a beneficial use.
7th. Proof of appropriation of water.

Upon a satisfactory showing that the appropriation has been perfected as provided by statute the State Hydraulic Engineer will issue a water right certificate.

(Blanks will be furnished by the office of State Hydraulic Engineer.)

APPLICATION NO. 924

CITY OF CAMAS

Examination made November 4, 1950

This application is for 2.5 c.f.s. from Little Washougal a tributary to Washougal River for domestic and municipal supply.

Mr. Sugg stated he did not question in his mind the legal right of this application.

I went over the ground with Mr. W. H. Barber, City Clerk and Superintendent of City Water and found the following:

This system was installed in 1925 after a survey had been made, a part of which included a survey for pipe line extended to Jones Creek. The main is of 10" steel pipe from the two reservoirs on a hill about a mile above town of Camas a distance of about 9 miles to a "Y" then approximately 2 miles of 8" pipe to point of diversion. There is approximately 2.5 c.f.s. now running in pipe line and approximately 1.5 c.f.s. going past intake.

Mr. Barber stated that they were taking all of the water up to the recent rains about a week ago and was not filling the pipe and the City of Camas was under a dangerous water shortage.

This application is in reference to application No. 5126.

A G Stevens

Signed this 15 day of Nov. 1950.

Y.K.
Subject to prior Permit #465

WELL No3

CERTIFICATE RECORD No. 1 PAGE No. 85-A

STATE OF WASHINGTON, COUNTY OF Clark

# Certificate of Ground Water Right

Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and the rules and regulations of the State Supervisor of Hydraulics thereunder.

THIS IS TO CERTIFY That THE CITY OF CAMAS

of Camas, Washington, has made proof to the satisfaction of the State Supervisor of Hydraulics of Washington, of a right to the use of the ground waters of a Well

located within the NW¼ of SW¼ of Sec. 12 Twp. 1 N. Rge. 3 E.W.M.

for the purpose of Municipal Supply

under Ground Water Permit No. 2 issued by the State Supervisor of Hydraulics, and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Hydraulics of Washington and entered of record in Volume 1 at page 85-A ; that the quantity of ground water to which such right is entitled and hereby confirmed for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1200 gallons per minute; 118 acre-feet per year; That the right hereby confirmed dates from July 21, 1945.

~~for irrigation of xxxxxxxxxxxxxx acres.~~

A description of the lands under such right to which the ground water hereby confirmed is appurtenant, and the place where such water is put to beneficial use, is as follows:

City of Camas, Clark County, Washington.

The right to the use of the ground water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Sections 6 and 7, Chapter 122, Laws of 1929.

WITNESS the seal and signature of the State Supervisor of Hydraulics affixed this 13th day of November, 19 47

State Supervisor of Hydraulics.

S. F. No. 7334—6-45—5C. 9235.

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION AND DEVELOPMENT
DIVISION OF HYDRAULICS

# Permit to Appropriate Public Ground Waters of the State of Washington

Book No. 1 of Ground Water Permits, on page 2 under Application No. 4

The City of Camas

of City Hall, Camas, Washington

is hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights, and to the limitations and provisions set out herein.

Priority date of this permit is July 21, 1945

Source of the proposed ground water appropriation is a well

within area, sub-area

zone. Name or number of works is

Quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 1200 gallons per minute; 118 acre-feet per year, to be used for the following purposes: Municipal supply

as more definitely set out below.

Location of the well, tunnel, or infiltration trench is North 7°31' East 480 feet and South 83°46' East 112 feet from the Northwest corner of Block 1 of Oak Park Addition to the City of Camas, being within NW¼ of SW¼ of Sec. 12, Twp. 1 N., Rge. 3 E.W.M., county of Clark

Use, or uses to which water is to be applied:

For municipal supply: 1200 gallons per minute; acre-feet per year, to supply The City of Camas

For irrigation: gallons per minute; acre-feet per year, for the irrigation of acres.

For miscellaneous uses: gallons per minute; acre-feet per year, for

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Camas, Clark County, Washington

DESCRIPTION OF WORKS FROM WHICH WATER IS TO BE WITHDRAWN

The well will be Drilled (Dug or drilled) and have a diameter of 14 inches, and depth of 95 feet.

Description of tunnel or infiltration trench:

(Please read carefully provisions below)

Particular specifications required by the Supervisor of Hydraulics for the purpose of preventing waste of public waters:

Construction work shall begin on or before July 1, 1946 and shall thereafter be prosecuted with reasonable diligence and completed on or before October 1, 1946 and complete application of water to proposed use shall be made on or before October 1, 1947

Given under my hand and the seal of this office at Olympia, Washington, this 20th day of September 1945

CLARENCE B. SHAIN
State Supervisor of Hydraulics

By: Chas. J. Northwest
Deputy.

GROUND WATER

APPLICATION NO. 4

... City of Camas.

The application of the City of Camas for the appropriation of 1200 gallons per minute from ground water through a well, which will be designated Well No. 3, was approved for a permit on September 6.

On September 21 the undersigned visited the locality, accompanied by Mr. Arthur K. Piper, Ground Water Geologist.

The City has a gravity water supply and an additional water supply from two wells. The supply from both of which sources does not furnish sufficient water for the town during the dry months. It was therefore found by the City officials that additional water had to be obtained in order to meet its requirements. For that reason they planned a third well to augment the water supply during critical periods.

Judging from the wells now in use, the amount of water applied for will be available and will be put to an important beneficial use.

Permit has been approved.

Signed this 25th day of September, 1945.

CHAS. J. BARTHOLET
Consulting Engineer

CERTIFICATE RECORD NO. 9 PAGE NO. 4072-A

STATE OF WASHINGTON, COUNTY OF Clark

# Certificate of Ground Water Right

Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the State Supervisor of Water Resources thereunder.

THIS IS TO CERTIFY That CITY OF CAMAS, WASHINGTON

of _____, has made proof to the satisfaction of the State Supervisor of Water Resources of Washington, of a right to the use of the ground waters of a well located within NW¼ NW¼ Sec. 12, Twp. 1 N., R. 3 E. W.M., for the purpose of municipal supply under and subject to provisions contained in Ground Water Permit No. 4804 issued by the State Supervisor of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the State Supervisor of Water Resources of Washington and entered of record in Volume 9 at page 4072-A, that the right hereby confirmed dates from February 12, 1959; that the quantity of ground water under the right hereby confirmed for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1325 gallons per minute; 1208 acre-feet per year for municipal supply.

Special provisions required by the Supervisor of Water Resources: _____

A description of the lands to which such ground water right is appurtenant:

City of Camas, Clark County, Washington.

The right to the use of the ground water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in Sections 6 and 7, Chapter 122, Laws of 1929.

WITNESS the seal and signature of the State Supervisor of Water Resources affixed this 24th day of November, 19 61.



M Grantham

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

# Permit to Appropriate Public Ground Waters of the State of Washington

Book No. 10 of Ground Water Permits, on page 404 under Application No. 5130

CITY OF CAMAS, WASHINGTON

or

is hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights, and to the limitations and provisions set out herein.

Priority date of this permit is February 12, 1959

Source of the proposed ground water appropriation is a well

within _____ area, _____ sub-area

_____ zone. Name or number of works is _____

Quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 1500 gallons per minute; 1206 acre-feet per year, to be used for the following purposes: municipal supply

as more definitely set out below.

Location of the well, tunnel, or infiltration trench is N.10°E. 150 feet from west quarter corner of sec.12

being within NW¼NW¼, sec.12, T.1 N., R.3 E.W.M.

county of Clark

Use, or uses to which water is to be applied:

For municipal supply: 1500 gallons per minute; 1206 acre-feet per year, to supply the City of Camas.

For irrigation: _____ gallons per minute; _____ acre-feet per year, for the irrigation of _____ acres.

For miscellaneous uses: _____ gallons per minute; _____ acre-feet per year for _____

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Camas, Clark County, Washington.

DESCRIPTION OF WORKS FROM WHICH WATER IS TO BE WITHDRAWN

The well will be drilled and have a diameter of 16 inches and depth of 135 feet.
(dug or drilled)

Description of tunnel or infiltration trench:

(Please read carefully provisions below).

Particular specifications required by the Supervisor of Water Resources for the purpose of preventing waste of public waters:

Construction work shall begin on or before May 1, 1960

and shall thereafter be prosecuted with reasonable diligence and completed on or before November 1, 1960

and complete application of water to proposed use shall be made on or before November 1, 1961

Given under my hand and the seal of this office at Olympia, Washington, this 6th day of May, 1959.

M. O. Watkins
State Supervisor of Water Resources

RETURN TO:
DIVISION OF WATER RESOURCES
335 GENERAL ADMINISTRATION BLDG.
OLYMPIA

RECEIVED
JUL 15 1959

# RECORD BY WELL DRILLER OR OTHER CONSTRUCTOR OF WORKS FOR WITHDRAWAL OF GROUND WATER

Under Permit No. G. W. 4804

("The well driller or other constructor of works for the withdrawal of public ground waters shall be obligated to furnish the permittee a certified record of the factual information necessary to show compliance with the provisions of this section." Sec. 8, Chap. 263, Laws of 1945.)

1. City of Camas, Washington
(Name and address of owner of well or other works for withdrawal of water)

2. Type; name or number of works where water is taken Well
(Well, tunnel or infiltration trench)

3. Date on which work on well or other structure was started June 2, 1959

4. Date on which work was completed July 7, 1959

5. If work on well or other structure was abandoned, give date _____

and reason for abandonment _____

6. DESCRIPTION OF WORKS:

(a) WELL: Depth 112 ft. Diameter 16 in. or ft. Dug or drilled Drilled

Flowing or pump well _____ Water Temp. 46 degrees

IF PUMP WELL: Type and size of pump is Test pump: 1500 g.p.m. pump 11½" bowl
9" pump column

Type and size of motor or engine is Gulberson Diesel 210 h.p.

Depth from ground surface to water level before pumping 35 ft.

After continuous operation for 8 hours (At least four), the measured discharge of the pump is 1500 g.p.m., and the drawdown of water level is 24 ft. (Pumping level minus static water level)

Recovery data (taken after pump has been shut off) (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level |
|---|---|---|---|
| Immediate recovery. | | | |
| | | | |
| | | | |
| | | | |

Date of test June 29, 1959

IF FLOWING WELL: Measured discharge _____ g.p.m. on _____ (Date)

Shut-in pressure at ground surface _____ lbs. per sq. in. on _____ (Date)

Water is controlled by _____ (Cap, valve, etc.)

CASING: (Give diameter, commercial specifications and depth below ground surface of each casing size.)

16 in. diameter _____ from 0 to 112 ft.

_____ in. diameter _____ from _____ to _____ ft.

_____ in. diameter _____ from _____ to _____ ft.

_____ in. diameter _____ from _____ to _____ ft.

Describe and show depth of shoe, plug, adapter, liner or other details:

Grout seal from 32-35.
Grout seal from 15-18

OK

Perforated casing or screens:

60 perf. per ft. each perf. 1&3/8 by 3/8" from 82 to 102 ft.
(Describe perforations or slots)

from ____ to ____ ft.

from ____ to ____ ft.

from ____ to ____ ft.

from ____ to ____ ft.

LOG OF WELL OR TUNNEL: (Describe each stratum or formation clearly, indicate if water bearing, and give thickness and depth as indicated.)

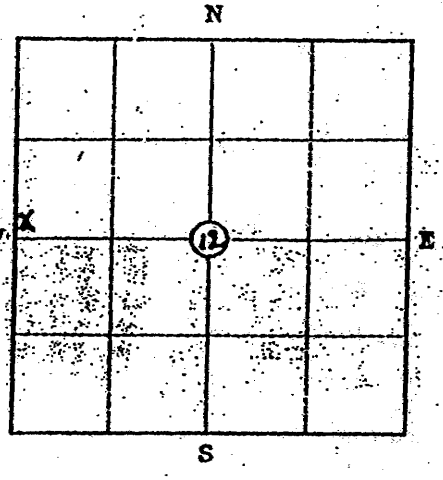
| MATERIAL | Thickness (Feet) | Depth to bottom (Feet) |
|---|---|---|
| Top soil | 3 | 3 |
| Gravel and boulders | 9 | 12 |
| Gravel, some binder | 9 | 21 |
| Gravel and boulders | 11 | 32 |
| Cemented gravel | 21 | 53 |
| Loose sand and gravel, some silt | 22 | 75 |
| Loose sand and gravel, water-bearing | 24 | 99 |
| Large gravel and sand | 11 | 110 |
| Clay and gravel | 2 | 112 |

(b) INFILTRATION TRENCH OR TUNNEL: Type ____

Dimensions: ____
(Tunnel—length, course, and cross-sectional size) (Trench—minimum and maximum depths)

Bottom width ____ ft. Discharge ____ g.p.m. Date of test ____

Position of water bearing stratum with reference to portal of tunnel ____




Scale: 1" = 2000'

Sec. 12 Twp. 1N Rge. 3E

Show approximate location of well or other works with (X) on section plat at left.

W. A. Shaw
Signature of well driller or other constructor

8110 S.E. Sunset Lane, Portland, Ore.
Address

STATE PRINTING PLANT OLYMPIA, WASH., 1947

well #4

# Report of Examination on Ground Water

Received date 2-5-59 Date of exam 2-12-59 Appl. No 5130

Name City of Camas Address Camas, Washington

Type of works well Dimensions 16"x125'

Progress of works not begun

Quantity applied for 1500 g.p.m. acre-feet per year

Legal sub. NW¼NE¼ Sec. 12 Twp. 1 N. Rge. 3 E. County Clark

Use municipal water supply

Irrigation-acreage: Present Planned Feasible

Municipal: Population 5391 as of 1959

Industrial

Time pump will be operated

Other water rights appurtenant to this land Cert's. 711, 712 & 85 A

Proximity to existing works, springs, wells, or streams approximately 300' to Washougal River; approx. 35' above river level

Area Sub-area Zone

## RECOMMENDATIONS

Approved for 1500 g.p.m. 1208 acre-feet per year, subject to existing water rights. (1 acre-foot 325,850 gallons.)

The water requirement for municiapl supply is calculated on a per capita consumption of 200 gallons a day or 0.224 acre-feet per year, a total of 1208 acre-feet per year for 5391 persons, less any quantity diverted to this use under existing water rights.

The installation of an access port to well as described in attached Ground Water Bulletin No. 1 is recommended.

Signed this 13th day of April, 1959.

DEE MOLENAAR, Geologist
Division of Water Resources

S. F. No. 2361—(Rev. 10-69)—10-69—534 15000.

CERTIFICATE RECORD NO. 14, PAGE NO. 6636-A

STATE OF WASHINGTON, COUNTY OF Clark

# CERTIFICATE OF GROUND WATER RIGHT

(Issued in accordance with the provisions of Chapter 263, Laws of Washington of 1945, and amendments thereto, and the rules and regulations of the Department of Water Resources thereunder.)

THIS IS TO CERTIFY That CITY OF CAMAS

of Camas, Washington, has made proof to the satisfaction of the Department of Water Resources of a right to the use of the public ground waters of the State of Washington from a well

located within Lot 9, Plat of Orchard Home within the City of Camas and road right of way abutting thereto to the east, of Sec. 12, Twp. 1 N., R. 3 E., W.M.,

for the purpose(s) of Municipal supply

under and specifically subject to provisions contained in Ground Water Permit No. 8627 issued by the Department of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Water Resources and entered of record in Volume 14 at page 6636-A; that the priority of the right hereby confirmed dates from March 22, 1968; that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed 600 gallons per minute, 920 acre-feet per year for municipal supply continuously during entire year to supply an estimated population of 8550 by 1970.

16636-A

A description of the lands to which such ground water right is appurtenant is as follows:

City of Camas

The right to use of water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390 and 90.44.020.

This certificate of ground water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

WITNESS the seal and signature of the Assistant Director, Division of Water Management, Department of Water Resources, affixed this 17th day of November, 19 69

Glen L. Liddell

Assistant Director
Division of Water Management
Department of Water Resources

Engineering Data

S. F. No. 7334—OS—4-67.

STATE OF WASHINGTON
DEPARTMENT OF WATER RESOURCES
DIVISION OF WATER MANAGEMENT

# Permit to Appropriate Public Ground Waters of the State of Washington

Book No. 18 of Ground Water Permits, on page 8627 under Application No. 9326

CITY OF CAMAS

of Camas, Washington

is hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights, and to the limitations and provisions set out herein.

Priority date of this permit is March 22, 1968

Source of the proposed ground water appropriation is a well

within _____ area, _____ sub-area

_____ zone. Name or number of works is _____

Quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 700 gallons per minute; 1120 acre-feet per year, to be used for the following purposes: municipal supply

as more definitely set out below.

Location of the well, tunnel, or infiltration trench is 2760 feet east and 840 feet north of southwest corner of Sec. 12

being within Lot 9, Plat of Orchard Home within City of Camas and road right-of-way abutting thereto to the east, of Sec. 12, T. 1 N., R. 3 E.W.M.

county of Clark

Use, or uses to which water is to be applied:

For municipal supply: 700 gallons per minute; 1120 acre-feet per year, to supply municipal supply for estimated population of 8500 by 1970

For irrigation: _____ gallons per minute; _____ acre-feet per year, for the irrigation of _____ acres.

For miscellaneous uses: _____ gallons per minute; _____ acre-feet per year, for _____

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Camas

## DESCRIPTION OF WORKS FROM WHICH WATER IS TO BE WITHDRAWN

The well will be drilled (Dug or drilled) and have a diameter of 8 inches, and depth of 70 feet.

Description of tunnel or infiltration trench:

Please read carefully provisions below)

Particular specifications required by the Department of Water Resources for the purpose of preventing waste of public waters:

Issued as a supplementary supply to Surface Water Certificates 711 and 712, Ground Water Certificates 85-A and 4072-A and concurrent Ground Water Application 9325, for 700 gallons per minute and ~~1120~~ 2240 acre-feet per year; the total quantity withdrawn or diverted from all sources is not to exceed 3300 acre-feet per year.

Construction work shall begin on or before Started

and shall thereafter be prosecuted with reasonable diligence and completed on or before September 1, 1969

and complete application of water to proposed use shall be made on or before September 1, 1970

Given under my hand and the seal of this office at Olympia, Washington, this 21st day of August, 19 68.

Glen H. Fuller
*Assistant Director*
*Division of Water Management*
*Department of Water Resources*

File Original and First Copy with the Division of Water Resources
Second Copy — Owner's Copy
Third Copy — Driller's Copy

# WATER WELL REPORT

STATE OF WASHINGTON

Application No. 9326

Permit No. 8627

(1) OWNER: Name City of Camas Address 616 N.E. 4th Avenue

(2) LOCATION OF WELL: County Clark - Lot 9, Plat of Orchard SW ¼ SE ¼ Sec. 12 T. 1 N. R. 3 E W.M.

Bearing and distance from section or subdivision corner: Home within City of Camas& road right of way abutting thereto the East of Sec. 12 TIN R3 East of WM

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☑
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 5
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 71 ft. Depth of completed well 71 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8 " Diam. from ft. to ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☒ No ☐
Type of perforator used
SIZE of perforations 3/8" in. by 1-1/4" in.
408 perforations from 44'6" ft. to 65 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☐ No ☐ To what depth? 22 ft.
Material used in seal Concrete grout
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off gravity

(7) PUMP: Manufacturer's Name Johnson
Type: V.H.S. Turbine H.P. 75

(8) WATER LEVELS: Land-surface elevation above mean sea level 36 ft.
Static level 36 ft. below top of well Date 7-25-68
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? O.J. Norris
Yield: 450 gal./min. with 1 ft. drawdown after 8 hrs.
" " " " "
" " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level | Time | Water Level |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

Date of test 3-16-68
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 53° Was a chemical analysis made? Yes ☒ No ☐

See attached copy

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

| MATERIAL | FROM | TO |
|---|---|---|
| Surface dirt with small boulder | 0 | 3 |
| Gravel & Bouxlers, very little binder | 3 | 7 |
| Gravel & boulders w/ clay binder | 7 | 21 |
| Large gravel & small boulders, loose | 21 | 24 |
| Med. size gravel, fairly loose | 24 | 33 |
| Med size gravel | 33 | 35 |
| Large to fine gravel, some red gravel | 35 | 45 |
| Started making water at 35 feet | | |
| Med. to fine gravel, clean some red - very little sand | 45 | 48 |
| Some larger gravel | 48 | 56 |
| Med. to fine gravel, clean & loose | 56 | 60 |
| Med to fine gravel clean, loose | 60 | 65 |
| Med to fine gravel, clean, loose | 65 | 67' 6" |
| Loose gravel formation | 67'6" | 68' 6" |
| Loose gravel formation | 68'6" | 69' 6" |
| Fine yellow sand | 69'6" | 71 |
| Sealed bottom with concrete | 71 | |

Work started Feb. 14 19 68 Completed Mar. 19 19 68

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME O.J. NORRIS - WATER WELL DRILLING
(Person, firm, or corporation) (Type or print)
Address 4411 N.E. 59th Avenue Vancouver, Washington

[Signed] O. J. Norris
(Well Driller)

License No. 223 02 4069 Date Sept. 9, 19 68

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 7154—(Rev. 2-66)—3-66—5M

WR

# Report of Examination on Ground Water

Received date March 22, 1968 Date of exam May 28, 1968 Appl. No. 9326

Name City of Camas Address 616 N.E. 4th Ave., Camas, Wash. 98607

Type of works a well Dimensions 8" x 70'

Progress of works Started

Quantity applied for 700 g.p.m. acre-feet per year

Legal sub / Sec 12 Twp 1 N. Rge 3 E. County Clark

Lot 9, Plat of Orchard Home within City of Camas & road right of way abutting thereto to the east

Use Municipal supply

Irrigation-acreage: Present Planned Feasible

Municipal: Population 8500 as of 1970

Industrial

Time pump will be operated May 1st through September 30th

Other water rights appurtenant to this land SW Cert. 711 for 1.0 cfs from Jones Cr. for dom. supply; SW Cert. 712 for 2.5 cfs from Little Washougal R. for Munic. supply; GW Cert. 85-A for 1200 gpm, 118 ac-ft/yr for munic. supply; GW Cert. 4072-A for 1325 gpm; 1208 ac-ft/yr for mun. sup.; and concurrent GW App. 9325 for 1500 gpm for mun. supply.

Proximity to existing works, springs, wells, or streams / City of Washougal, northeasterly 1200 feet

Area Sub-area Zone

## RECOMMENDATIONS

Approved for 700 g.p.m. 1120 acre-feet per year, subject to existing water rights. (1 acre-foot 325,850 gallons.)

It is noted that the well site and water transmission facilities therefrom are not located upon the land owned by the applicant. Applicant is, accordingly, advised that the issuance of permit by this department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the State Director of Health prior to any new construction or alterations of a public water supply. The applicant is advised to contact the Washington State Department of Health, 304 Public Health Building, Olympia, with regard to the need for compliance.

The following water rights are appurtenant to this land:

| Certificate Number | c.f.s./g.p.m. |
|---|---|
| Surface Water Cert. 711 | 1.0 c.f.s. |
| Surface Water Cert. 712 | 2.5 c.f.s. |
| Ground Water Cert. 85-A | 1200 g.p.m. |
| Ground Water Cert. 4072-A | 1325 g.p.m. |
| Concurrent Ground Water Appli. 9325 | 1500 g.p.m. |

(over)

The total requirement based on an engineering study is 345 gallons per capita per day for all purposes for an estimated population of 8500 by 1970, or approximately 3300 acre-feet per year.

The quantity recommended under this application is 700 gallons per minute pumping continuously, or 1120 acre-feet per year.

The permit when issued will carry the following provision: "Issued as a supplementary supply to Surface Water Certificates 711 and 712, Ground Water Certificates 85-A and 4072-A and concurrent Ground Water Application 9225, for 700 gallons per minute and 1120 acre-feet per year, the total quantity withdrawn or diverted from all sources is not to exceed 3300 acre-feet per year."

Signed at Olympia, Washington
this 5 day of June, 1968

B. A. CAMERON, Engineer
Division of Water Management

S. F. No. 7341—(Rev. 10-801—10-60—33M 12000.

CERTIFICATE RECORD NO. 14, PAGE NO. 6635-A

STATE OF WASHINGTON, COUNTY OF Clark

# CERTIFICATE OF GROUND WATER RIGHT

(Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Water Resources thereunder.)

THIS IS TO CERTIFY That CITY OF CAMAS

of Camas, Washington, has made proof to the satisfaction of the Department of Water Resources of a right to the use of the public ground waters of the State of Washington from a well

located within David C. Parker D.L.C. No. 48

Sec. 12, Twp. 1 N., R. 3 E. W.M.,

for the purpose(s) of Municipal supply

under and specifically subject to provisions contained in Ground Water Permit No. 8344

issued by the Department of Water Resources and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Water Resources and entered of record in Volume 14 at page ~~6435-A~~ 6635-A; that the priority of the right hereby confirmed dates from March 22, 1968; that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1500 gallons per minute, 2400 acre-feet per year for municipal supply to supply a population of 8500 by 1970 continuously during entire year.

A description of the lands to which such ground water right is appurtenant is as follows:

City of Camas

The right to use of water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390 and 90.44.020.

This certificate of ground water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

WITNESS the seal and signature of the Assistant Director, Division of Water Management, Department of Water Resources, affixed this 17th day of November, 19 69

C-37

Glen H. Lidke

S. F. No. 7334—OS—4-61.

STATE OF WASHINGTON
DEPARTMENT OF WATER RESOURCES
DIVISION OF WATER MANAGEMENT

# Permit to Appropriate Public Ground Waters of the State of Washington

Book No. 18 of Ground Water Permits, on page 8544 under Application No. [illegible]

CITY OF CAMAS

of Camas, Washington

is hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights, and to the limitations and provisions set out herein.

Priority date of this permit is March 22, 1968

Source of the proposed ground water appropriation is a well

within _____ area, _____ sub-area

_____ zone. Name or number of works is _____

Quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 1500 gallons per minute; 2400 acre-feet per year, to be used for the following purposes: municipal supply

as more definitely set out below.

Location of the well, tunnel, or infiltration trench is 2300 feet east and 1800 feet north of southwest corner of Sec. 12

being within David C. Parker D.L.C. No. 48 of Sec. 12, T. 1 N., R. 3 E.W.M.

county of Clark

Use, or uses to which water is to be applied:

For municipal supply: 1500 gallons per minute; 2400 acre-feet per year, to supply a population of 8500 by 1970 continuously during entire year.

For irrigation: _____ gallons per minute; _____ acre-feet per year, for the irrigation of _____ acres.

For miscellaneous uses: _____ gallons per minute: _____ acre-feet per year, for _____

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

City of Camas

## DESCRIPTION OF WORKS FROM WHICH WATER IS TO BE WITHDRAWN

The well will be drilled (Dug or drilled) and have a diameter of 16 inches, and depth of 85 feet.

Description of tunnel or infiltration trench:

Please read carefully provisions below)

Particular specifications required by the Department of Water Resources for the purpose of preventing waste of public waters: 1) The installation of an access port as described in attached Ground Water Bulletin No. 1 shall be required prior to issuance of final Certificate of Water Right. 2) Issued as a supplementary supply to Surface Water Certificates 711 and 712, Ground Water Certificates 85-A and 4072-A and concurrent Ground Water Application 9126, for 1500 gallons per minute and 2400 acre-feet per year; the total quantity withdrawn or diverted from all sources is not to exceed 3300 acre-feet per year.

(Conditional Use)

2400

Construction work shall begin on or before July 1, 1969

and shall thereafter be prosecuted with reasonable diligence and completed on or before July 1, 1970

and complete application of water to proposed use shall be made on or before July 1, 1971

Given under my hand and the seal of this office at Olympia, Washington, this 20th day of June, 1968

Glen H. Fuller

*Assistant Director*
*Division of Water Management*
*Department of Water Resources*

WELL #6

# Report of Examination on Ground Water

Received date March 22, 1968 Date of exam. May 28, 1968 Appl. No. 9325

Name City of Camas Address 616 N.E. 4th Ave., Camas, Wash. 98607

Type of works a well Dimensions 16" x 85'

Progress of works Not started

Quantity applied for 1500 g.p.m. 2300 acre-feet per year

David C. Parker D.L.C. No. 48

Legal sub. / Sec. 12 Twp. 1 N. Rge. 3 E. County Clark

Use Municipal supply

Irrigation-acreage: Present Planned Feasible

Municipal: Population 8500 as of 1970

Industrial

Time pump will be operated Continuously

Other water rights appurtenant to this land SW Cert. 711 for 1.0 cfs from Jones Cr. for dom. supply; SW Cert. 712 for 2.5 cfs from Little Washougal R. for munic. supply; GW Cert. 85-A for 1200 gpm, 118 ac-ft/yr for munic. supply; GW Cert. 4072-A for 1325 g.p.m; 1208 ac-ft/yr for mun. sup.; and concurrent GW App. 9326 for mun. supply, 700 gpm.

Proximity to existing works, springs, wells, or streams /

City of Camas, west 1300 feet:

City of Washougal, east 1300 feet

Area Sub-area Zone

## RECOMMENDATIONS

Approved for 1500 g.p.m. 2400 acre-feet per year, subject to existing water rights. (1 acre-foot 325,850 gallons.)

It is noted that the well site and water transmission facilities therefrom are not located upon the land owned by the applicant. Applicant is, accordingly, advised that the issuance of permit by this department for appropriation of the waters in question does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtainment of such right is a private matter between applicant and owner of that land.

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the State Director of Health prior to any new construction or alterations of a public water supply. The applicant is advised to contact the Washington State Department of Health, 304 Public Health Building, Olympia, with regard to the need for compliance.

The installation of an access port as described in attached Ground Water Bulletin No. 1 shall be required prior to issuance of final Certificate of Water Right. The applicant may, for his own convenience, wish to install an air-line and gage in addition to the access port.

(over)

The following water rights are appurtenant to this land:

| Certificate Number | c.f.s./g.p.m. |
|---|---|
| Surface Water Cert. 711 | 1.0 c.f.s. |
| Surface Water Cert. 712 | 2.5 c.f.s. |
| Ground Water Cert. 85-A | 1200 g.p.m. |
| Ground Water Cert. 4072-A | 1325 g.p.m. |
| Concurrent Ground Water Appli. 9326 | 700 g.p.m. |

The total requirement based on an engineering study is 345 gallons per capita per day for all purposes for an estimated population of 8500 by 1970, or approximately 3300 acre-feet per year.

The quantity recommended under this application is 1500 gallons per minute pumping continuously, or 2400 acre-feet per year.

The permit when issued will carry the following provision: "Issued as a supplementary supply to Surface Water Certificates 711 and 712, Ground Water Certificates 85-A and 4072-A and concurrent Ground Water Application 9326, for 1500 gallons per minute and 2400 acre-feet per year; the total quantity withdrawn or diverted from all sources is not to exceed 3300 acre-feet per year."

Signed at Olympia, Washington
this 2 day of June, 1968

B. A. CAMERON, Engineer
Division of Water Management

File Original and First Copy with the Division of Water Resources
Second Copy -- Owner's Copy
Third Copy -- Driller's Copy

# WATER WELL REPORT

STATE OF WASHINGTON

Application No. 9325

Permit No. 8544

(1) OWNER: Name City of Camas Address 616 N.E. 4th Avenue

(2) LOCATION OF WELL: County Clark David C Parker D.L.C. #48 NE¼ SW¼ Sec. 12 T. 1 N. R. 3E W.M.

Bearing and distance from section or subdivision corner.

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 6
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 16 inches.
Drilled 85 ft. Depth of completed well 85 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 16"OD Diam. from 0 ft. to 85 ft.
Threaded ☐ ____" Diam. from ____ ft. to ____ ft.
Welded ☒ ____" Diam. from ____ ft. to ____ ft.

Perforations: Yes ☒ No ☐
Type of perforator used Mill knife
SIZE of perforations 5/16 in. by 3-1/2 in.
____ perforations from ____ ft. to ____ ft.
552 perforations from 56 ft. to 80 ft.
____ perforations from ____ ft. to ____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name ____
Type ____ Model No. ____
Diam. ____ Slot size ____ from ____ ft. to ____ ft.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: ____
Gravel placed from ____ ft. to ____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 22 ft.
Material used in seal Concrete grout
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ____ Depth of strata 27
Method of sealing strata off ____

(7) PUMP: Manufacturer's Name ____
Type: ____ H.P. ____

(8) WATER LEVELS: Land-surface elevation above mean sea level 48 ft.
Static level 45 ft. below top of well Date 6-29-68
Artesian pressure ____ lbs. per square inch Date ____
Artesian water is controlled by ____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? City
Yield: 1600 gal./min. with 5 ft. drawdown after 12 hrs
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level | Time | Water Level |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

Date of test June 29, 1968
Bailer test ____ gal./min. with ____ ft drawdown after ____ hrs.
Artesian flow ____ g.p.m. Date ____
Temperature of water 53° Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

| MATERIAL | FROM | TO |
|---|---|---|
| Surface Soil | 0 | 2 |
| Gravel & Small Boulders | 2 | 6 |
| Gravel & Boulders | 6 | 10 |
| Gravel & Small Boulders | 10 | 14 |
| Boulders | 14 | 15 |
| Pea Gravel | 15 | 17 |
| Boulders | 17 | 19 |
| Boulders | 19 | 21 |
| Large to Medium gravel | 21 | 26 |
| Medium to fine gravel, some sand | 26 | 30 |
| Medium to fine gravel with a few boulders | 30 | 40 |
| Med. to fine gravel with fine sand | 40 | 48'6" |
| Med to fine gravel with some sand | 48'6" | 53 |
| Water bearing gravel and sand | 53 | 55 |
| Med to fine gravel, water bearing | 55 | 59 |
| Med to fine gravel, water bearing | 59 | 69 |
| Med to fine gravel, some black sand water bearing | 69 | 76 |
| Med to large gravel | 76 | 80 |
| Gravel & small boulders, very tight formation | 80 | 83'9" |
| Med hard gray rock | 83'9" | 85 |

Work started June 5, 1968 Completed 6-27-68, 19

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME O.J. NORRIS-WATER WELL DRILLING
(Person, firm, or corporation) (Type or print)
Address 4411 N.E. 59th Avenue Vancouver, Washington

[Signed] O. J. Norris
(Well Driller)

License No. 223 02 4069 Date Sept. 9, 1968

See Enclosed

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 1386—(Rev. 3-66)—3-66—5M. 4516

CK/WCL

S. F. No. 1381—(Rev. 6-70).

WELL No 7

CERTIFICATE RECORD NO. ——, PAGE NO. G 2-00501 C

STATE OF WASHINGTON, COUNTY OF Clark

# CERTIFICATE OF GROUND WATER RIGHT

(Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology thereunder.)

THIS IS TO CERTIFY That CITY OF CAMAS

of Camas, Washington, has made proof to the satisfaction of the Department of Ecology of a right to the use of the public ground waters of the State of Washington from a well

located within a portion of David C. Parker D.L.C. #48 lying within the SW¼ within the city limits of Camas

Sec. 12, Twp. 1 N., R. 3 E., W.M.,

for the purpose(s) of municipal supply

under and specifically subject to provisions contained in Ground Water Permit No. 10515 issued by the Department of Ecology and that said right to the use of said ground waters has been perfected in accordance with the laws of Washington, and is hereby confirmed by the Department of Ecology and entered of record in Volume — at page G 2-00501 C ; that the priority of the right hereby confirmed dates from March 22, 1971 ; that the quantity of ground water under the right hereby confirmed for the aforesaid purposes, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1000 gallons per minute; 530 acre-feet per year, during entire year for municipal supply.

A description of the lands to which such ground water right is appurtenant is as follows:

Area served by the City of Camas.

The right to use of water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390 and 90.44.020.

This certificate of ground water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and seal of this office at Olympia, Washington, this 16th day of February, 1973.

JOHN A. BIGGS, Director
Department of Ecology

by R. L. Bolton

Engineering Data
TM

C-43

S. F. No. 7354—(Rev. 6-70)

Well No 7

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

# Permit to Appropriate Public Waters of the State of Washington

Book No. 22 of Ground Water Permits, on page 10515 under Application No. 11718

CITY OF CAMAS

of CAMAS, WASHINGTON

is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public ground waters of the State of Washington, subject to existing rights and to the limitations and provisions set out herein.

Priority date of this permit is March 22, 1971

Source(s) of the proposed ground water appropriation is/~~are~~ a well

The quantity of water appropriated shall be limited to the amount which can be beneficially applied and not to exceed 1000 gallons per minute; 530 acre-feet per year, to be used for the following purposes: municipal supply

as more definitely set out below.

Approximate location(s) of the point(s) of withdrawal is/~~are~~ 1245 feet east and 2145 feet north of southeast corner of Sec. 12

being within A portion of David C. Parker D.L.C. # 48 lying within the SW¼ within the city limits of Camas

of Sec. 12, Twp. 1 N., Rge. 3 E. W.M., Clark County.

The use, or uses, to which water is to be applied:

~~Domestic~~/municipal supply: 1000 gallons per minute; 530 acre-feet per year, during entire year.

Irrigation: gallons per minute; acre-feet per year from to , each year, for the irrigation of acres.

Other use(s): gallons per minute: acre-feet per year, from to each year, for

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the City of Camas

ADDITIONAL LIMITATIONS AND PROVISIONS: The installation and maintenance of an access port as described in Ground Water Bulletin No. ' shall be required prior to issuance of final Certificate of Water Right.

**The total amount of water to be withdrawn or diverted, which includes the amounts as approved in Surface Water Certificates No. 711 and 712 and Ground Water Certificates Nos. 85, 4072, 6635 and 6636 shall not exceed 5750 acre-feet per year.**

**Nothing in this permit** shall **be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971.**

DESCRIPTION OF PROPOSED WORKS:

The well will be drilled (Dug or drilled) and have a diameter of 14 inches, and depth of 85 feet.

Description of tunnel or infiltration trench: _____

DEVELOPMENT SCHEDULE:

Construction work shall begin on or before Started

and shall thereafter be prosecuted with reasonable diligence and completed on or before November 1, 1972

and complete application of water to proposed use shall be made on or before November 1, 1973

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Olympia, Washington, this 10th day of November 19 71.

JOHN A. BIGGS, *Director*
Department of Ecology

by R. Jerry Bollen

ENGINEERING DATA

File Original and First Copy with the Division of Water Resources
Second Copy — Owner's Copy
Third Copy — Driller's Copy

# WATER WELL REPORT
## STATE OF WASHINGTON

Application No. 11716
Permit No. .....

**(1) OWNER:** Name CITY OF CAMAS, WASH Address 616 NE 4TH AVE CAMAS, WASH

**(2) LOCATION OF WELL:** County CLARK — NE¼ SW¼ Sec 12 T 1 N. R 3E W.M.

Bearing and distance from section or subdivision corner

**(3) PROPOSED USE:** Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

**(4) TYPE OF WORK:** Owner's number of well (if more than one) 7
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

**(5) DIMENSIONS:** Diameter of well 14 inches.
Drilled 84 ft. Depth of completed well 84 ft.

**(6) CONSTRUCTION DETAILS:**
**Casing installed:** 14" Diam. from +5 ft. to 84 ft.
Threaded ☐ ..." Diam. from ... ft. to ... ft.
Welded ☒ ..." Diam. from ... ft. to ... ft.

**Perforations:** Yes ☒ No ☐
Type of perforator used STAR
SIZE of perforations 3/8 in. by 1¼ in.
520 perforations from 49 ft. to 77 ft.
... perforations from ... ft. to ... ft.
... perforations from ... ft. to ... ft.

**Screens:** Yes ☐ No ☒
Manufacturer's Name ...
Type ... Model No. ...
Diam. ... Slot size ... from ... ft. to ... ft.
Diam. ... Slot size ... from ... ft. to ... ft.

**Gravel packed:** Yes ☐ No ☒ Size of gravel: ...
Gravel placed from ... ft. to ... ft.

**Surface seal:** Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal CEMENT GROUT
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ... Depth of strata ...
Method of sealing strata off ...

**(7) PUMP:** Manufacturer's Name ...
Type: Submersible Turbine HP 100

**(8) WATER LEVELS:** Land-surface elevation above mean sea level ... ft.
Static level 8.5 ft. below top of well Date 6/22/71
Artesian pressure ... lbs. per square inch Date ...
Artesian water is controlled by ... (Cap, valve, etc.)

**(9) WELL TESTS:** Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? STRASSER
Yield: 1000 gal./min. with 4 ft. drawdown after 1½ hrs.
" 1425 " 5 " 6 "
" 1200 " 4 " 24 "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level | Time | Water Level |
|---|---|---|---|---|---|
| IMMEDIATE | RECOVERY | | | | |

Date of test JUNE 22, 1971
Bailer test ... gal./min. with ... ft. drawdown after ... hrs.
Artesian flow ... g.p.m. Date ...
Temperature of water 57 Was a chemical analysis made? Yes ☐ No ☒

**(10) WELL LOG:**
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

| MATERIAL | FROM | TO |
|---|---|---|
| GRAVEL AND BOULDERS | 0 | 8 |
| GRAVEL, SOME CLAY | 8 | 18 |
| CEMENTED GRAVEL | 18 | 20 |
| LOOSE GRAVEL | 20 | 30 |
| PACKED GRAVEL | 30 | 36 |
| GRAVEL AND GREY CLAY | 36 | 39 |
| LOOSE GRAVEL (WATER) | 39 | 65 |
| MEDIUM GRAVEL (WATER) | 65 | 70 |
| LARGE GRAVEL (WATER) | 70 | 81 |
| RED CLAY | 81 | 84 |

RECEIVED
DEPARTMENT OF ECOLOGY
JUL 1 1971
AM
7 8 9 10 11 12 1 2 3 4 5 6 PM

Work started JUNE 7, 19 71 Completed JUNE 25, 19 71

**WELL DRILLER'S STATEMENT:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME R J STRASSER DRILLING CO (Person, firm, or corporation) (Type or print)
Address 8110 SE SUNSET LANE PORTLAND ORE
[Signed] Robert L Strasser (Well Driller)
License No 223022806 Date JULY 12, 1971

(USE ADDITIONAL SHEETS IF NECESSARY)

S. F. No. 7256—(Rev. 2-68)—[illegible] 4516.

OK/WPR

well #7

# Report of Examination on Ground Water

Received date March 22, 1971 Date of exam. August 31, 1971 Appli. No. 11718

Name City of Camas Address 616 N.E. 4th Ave., Camas WA 98607

Type of works A well Dimensions 14" x 85'

Progress of works Well drilled and capped

Quantity applied for 1000 g.p.m. 530 acre-feet per year of David C. Parker P.L.C. #48 within the City of Camas (lying within the SW¼)

Legal sub A portion/Sec. 12 Twp. 1 Rge. 3 E. County Clark

Use Municipal supply

Irrigation-acreage: Present Planned Feasible

Municipal: ~~Population~~ Area served 15,000 as of 1990

Industrial

Time pump will be operated Continuously

Other water rights appurtenant to this land See Surface Water Certificates Nos. 712 & 711; Ground Water Certificates Nos. 85, 4072, 6635 and 6636

Proximity to existing works, springs, wells, or streams City of Camas, west 400'; City of Camas, southeasterly 1000'; City of Camas, north; Washougal River, north 200'

Area Sub-area Zone

## RECOMMENDATIONS

Approved for 1000 g.p.m. 530 acre-feet per year, subject to existing water rights. (1 acre-foot 325,850 gallons.)

The installation of an access port as described in attached Ground Water Bulletin No. 1 shall be required prior to issuance of final certificate of water right. The applicant may, for his own convenience, wish to install an airline and gage in addition to the access port.

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the Assistant Secretary, Division of Health prior to any new construction or alterations of a public water supply. The applicant is advised to contact the Washington State Division of Health, Public Health Bldg. No. 7, Thurston Airdustrial Center, Olympia, with regard to the need for compliance.

The following water rights are appurtenant to this land:

| Certificate No. | c.f.s./g.p.m. | ac-ft per yr. |
|---|---|---|
| SWC 711 | 1.0 c.f.s. | 730 |
| SWC 712 | 2.5 c.f.s. | 1820 |
| GWC 85-A | 1200 g.p.m. | 118 |
| GWC 4072-A | 1325 g.p.m. | 1208 |
| GWC 6635 | 1500 g.p.m. | 2400 |
| GWC 6636 | 600 g.p.m. | 920 |

The total requirement based on an engineering study is 345 gallons per capita per day for all purposes for an estimated population of 15,000 by 1990 or approximately 5,750 acre-feet per year.

The quantity recommended under this application is 1000 gallons per minute not to exceed 530 acrefeet per year as requested in the application.

The permit when issued will carry the following provision: 'The total amount of water to be withdrawn or diverted, which includes the amounts as approved in Surface Water Certificates Nos. 711 and 712 and Ground Water Certificates Nos. 85, 4072, 6635 and 6636 shall not exceed 5,750 acre-feet per year."

Additionally, the permit when issued shall carry the following provision: "Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971."

Signed at Olympia, Washington
this 28th day of September, 1971.

JERRY LOUTHAIN, Engineer
Department of Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

# CERTIFICATE OF WATER RIGHT

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

| PRIORITY DATE | APPLICATION NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| February 4, 1977 | G 2-24400 | G 2-24400 P | G 2-24400 C |

NAME
CITY OF CAMAS

| ADDRESS (STREET) | (CITY) | (STATE) | (ZIP CODE) |
|---|---|---|---|
| P.O. Box 1055 | Camas | Washington | 98607 |

*This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown.*

## PUBLIC WATER TO BE APPROPRIATED

SOURCE
well

TRIBUTARY OF (IF SURFACE WATERS)

| MAXIMUM CUBIC FEET PER SECOND | MAXIMUM GALLONS PER MINUTE | MAXIMUM ACRE-FEET PER YEAR |
|---|---|---|
| | 900 | 530 |

| QUANTITY, TYPE OF USE, PERIOD OF USE | | |
|---|---|---|
| 530 acre-feet per year | municipal supply | continuously |

## LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
1375 feet East and 2145 feet North of Southwest corner of Section 12.

| LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) | SECTION | TOWNSHIP N. | RANGE, (E. OR W.) W.M. | W.R.I.A. | COUNTY |
|---|---|---|---|---|---|
| SW¼ | 12 | 1 | 3 E | 28 | Clark |

## RECORDED PLATTED PROPERTY

| LOT | BLOCK | OF (GIVE NAME OF PLAT OR ADDITION) |
|---|---|---|
| | | |

## LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Camas Municipal water system.

PROVISIONS

"The total amount of water to be withdrawn or diverted, which includes the amounts as approved in Surface Water Certificate No. 711 and 712 and Ground Water Certificate Nos. 85A, 4072 A, 6635 A and G 2-00501 and this certificate shall not exceed 5750 acre-feet per year."

↑ 6635A ?

The access port as required on your permit shall be maintained at all times.

"All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under Chapter 18.104 RCW (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and maintenance of Water Wells)."

*The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.*

**This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.**

*Given under my hand and the seal of this office at* Olympia *Washington, this* 23rd *day of* May, *19* 79

WILBUR G. HALLAUER, DIRECTOR
Department of Ecology

by E.W. Asselstine
E.W. ASSELSTINE, Regional Manager

ENGINEERING DATA
OK RPP
0165

FOR COUNTY USE ONLY

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

# WATER WELL REPORT
STATE OF WASHINGTON

Application No. 52-24400P
Permit No.

(1) OWNER: Name City of Camas Address Camas, Washington

(2) LOCATION OF WELL: County Clark NW¼ SW¼ Sec. 12 T. 1 N. R. 3E W.M.
Bearing and distance from section or subdivision corner 1375 E. & 2145' N of SW Cor of Sec 12

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 8
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 14 inches.
Drilled 87 ft. Depth of completed well 87 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 14" Diam. from 0 ft. to 87 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.
(3' riser added for future fill)
Perforations: Yes ☒ No ☐
Type of perforator used Mills Knife
Size of perforations 3/8 in. by 3½ in.
8 rows perforations from 44 ft. to 79 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft
Material used in seal Cement
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 33.2 ft. below top of well Date 5/10/77
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? driller
Yield: 1,040 gal./min. with 1.15 ft. drawdown after ½ hrs.
" 1,791 " 3.60 " 6 "
" 1,921 " 3.65 " 7 "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level | Time | Water Level |
|---|---|---|---|---|---|
| 0:00 | 36.85 | | | | |
| 7:00 | 34.00 | | | | |
| minutes | | | | | |

Date of test 5/10/77
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 50° Was a chemical analysis made? Yes ☒ No ☐

OK PMS

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

| MATERIAL | FROM | TO |
|---|---|---|
| Topsoil | 0 | 6" |
| Gravel, small boulders | 6" | 4' |
| Gravel, boulders | 4' | 21' |
| Gravel, small boulders, brown clay seams | 21' | 37' |
| Gravel, loose, some brown clay | 37' | 39' |
| Gravel, sand, gray | 39' | 42' |
| Gravel, sand, gray, water bearing | 42' | 49' |
| Gravel, medium size, sand, gray, loose, water bearing | 49' | 55' |
| Gravel, small to large, loose, water bearing | 55' | 75' |
| Gravel, medium to large, loose | 75' | 79' |
| Gravel, large, red clay | 79' | 82' |
| Clay, red | 82' | 87' |

RECEIVED
JUN 6 1977
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 4/14 19 77 Completed 5/19 19 77

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME NORRIS DRILLING & PUMP CO., INC.
(Person, firm, or corporation) (Type or print)
Address 11026 N.E. St. Johns Blvd. Vancouver, Washington 98665

[Signed] O. J. Norris
(Well Driller)

License No. 0366 Date June 6 19 77

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

# PERMIT

## TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

| PRIORITY DATE | APPLICATION NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| February 4, 1977 | G 2-24400 | G 2-24400 P | |

NAME
CITY OF CAMAS

| ADDRESS (STREET) | (CITY) | (STATE) | (ZIP CODE) |
|---|---|---|---|
| 616 NE 4th Ave. PO Box 1065 | Camas | Washington | 98607 |

*The applicant is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public waters of the State of Washington, subject to existing rights and to the limitations and provisions set out herein.*

### PUBLIC WATER TO BE APPROPRIATED

SOURCE
well

TRIBUTARY OF (IF SURFACE WATERS)

| MAXIMUM CUBIC FEET PER SECOND | MAXIMUM GALLONS PER MINUTE | MAXIMUM ACRE-FEET PER YEAR |
|---|---|---|
| | 900 | 530 |

QUANTITY, TYPE OF USE, PERIOD OF USE
530 acre-feet per year — municipal supply — continuously

### LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
1375 feet East and 2145 feet North of Southwest corner of Section 12.

| LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) | SECTION | TOWNSHIP N. | RANGE, (E. OR W.) W.M. | W.R.I.A. | COUNTY |
|---|---|---|---|---|---|
| SW¼ | 12 | 1 | 3 E | 28 | Clark |

### RECORDED PLATTED PROPERTY

| LOT | BLOCK | OF (GIVE NAME OF PLAT OR ADDITION) |
|---|---|---|
| | | |

### LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Camas Municipal water system.

## DESCRIPTION OF PROPOSED WORKS

Well 14" x 85', 100 HP pump to municipa water system.

## DEVELOPMENT SCHEDULE

| BEGIN PROJECT BY THIS DATE: | COMPLETE PROJECT BY THIS DATE: | WATER PUT TO FULL USE BY THIS DATE: |
|---|---|---|
| Started | July 1, 1979 | July 1, 1980 |

## PROVISIONS

"The total amount of water to be withdrawn or diverted, which includes the amounts as approved in surface water certificate No. 711 and 712 and Ground Water Certificate Nos. 85A, 4072 A, 5635 A and G2-00501 and this permit shall not exceed 5750 acre-feet per year.

The installation of an access port as described in Ground Water Bulletin No. 1 shall be required prior to issuance of final certificate of water right. The permittee, may for his own convenience, wish to install an airline and gage in addition to the access port.

"All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under Chapter 18.104 RCW (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and maintenance of Water Wells)."

Nothing in this permit shall be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971.

*This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.*

*Given under my hand and the seal of this office at* Olympia *Washington, this* 15th *day of* March, *19* 78

WILBUR HALLAUER, DIRECTOR
Department of Ecology

by E.W. Asselstine

E.W. Asselstine, Regional Manager

ENGINEERING DATA
OK RPB

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

# REPORT OF EXAMINATION
## TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology)

| PRIORITY DATE | APPLICATION NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| February 4, 1977 | G 2-24400 | | |

NAME
CITY OF CAMAS

| ADDRESS (STREET) | (CITY) | (STATE) | (ZIP CODE) |
|---|---|---|---|
| 616 NE 4 th Ave | Camas | Washington | 98607 |

## PUBLIC WATERS TO BE APPROPRIATED

SOURCE
well

TRIBUTARY OF (IF SURFACE WATERS)

| MAXIMUM CUBIC FEET PER SECOND | MAXIMUM GALLONS PER MINUTE | MAXIMUM ACRE-FEET PER YEAR |
|---|---|---|
| | 900 | 530 |

| QUANTITY, TYPE OF USE, PERIOD OF USE | | |
|---|---|---|
| 530 acre-feet per year | municipal supply | continuously |

## LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
1375 feet East and 2145 feet North of Southwest corner of Section 12.

| LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) | SECTION | TOWNSHIP N. | RANGE, (E. OR W.) W.M. | W.R.I.A. | COUNTY |
|---|---|---|---|---|---|
| SW¼ | 12 | 1 | 3 E | 28 | Clark |

## RECORDED PLATTED PROPERTY

| LOT | BLOCK | OF (GIVE NAME OF PLAT OR ADDITION) |
|---|---|---|
| | | |

## LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the Camas Municipal water system.

## DESCRIPTION OF PROPOSED WORKS

1 14" x 85', 100 HP pump to municipal water system.

## DEVELOPMENT SCHEDULE

| BEGIN PROJECT BY THIS DATE: | COMPLETE PROJECT BY THIS DATE: | WATER PUT TO FULL USE BY THIS DATE: |
|---|---|---|
| Started | July 1, 1979 | July 1, 1980 |

## PROVISIONS

Recommend this application be approved for 900 gallon per minute and 530 acre-feet per year for a municipal supply for the City of Camas.

The following water rights are appurtenant to this land.

| Certificate No. | CFS/GPM | Acre-feet per year |
|---|---|---|
| SWC 711 | 1.0 CFS | 730 |
| SWC 712 | 2.5 CFS | 1820 |
| GWC 85-A | 1200 GPM | 118 |
| GWC 4072 A | 1325 GPM | 1208 |
| GWC 6635 | 1500 GPM | 2400 |
| GWC 6636 | 600 GPM | 920 |
| G2 - 00501 C | 1000 GPM | 530 |

total requirement based on an engineering study is 345 gallons per capita per day for all poses for an estimated population of 15,000 by 1990 or approximately 5,750 acre-feet per year. The permit when issued will carry the following provision: "The total amount of water to be withdrawn or diverted, which includes the amounts as approved in surface water certificate Nos. 711 and 712 and Ground Water Certificate Nos. 85A, 4072A, 6635 A 6636 A and G2-00501 and this application shall not exceed 5750 acre-feet per year.

The installation of an access port as described in attached Ground Water Bulletin No. 1 shall be required prior to issuance of final certificate of water right. The applicant may for his own convenience, wish to install an airline and gage in addition to the access port.

Use of the waters to be appropriated under this application will be for a public water supply. State Board of Health rules require every owner of a public water supply to obtain written approval from the Water Supply and Waste Section, Department of Social and Health Services, Mail Stop 4-1, Building 4, Olympia, Washington, 98504, prior to any new construction or alterations of a public water supply.

"All water wells constructed within the state shall meet the minimum standards for construction and maintenance as provided under Chapter 18.104 RCW (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells)."

Nothing in this application shall be construed as excusing the applicant from compliance with any applicable federal, state, or local statutes, ordinances, or regulations including those administered by local agencies under the Shoreline Management Act of 1971.

ned at Olympia, Washington,
...is 4 day of August, 1977.

Robert P. Burrell
Department of Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

# *PERMIT*

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

| PRIORITY DATE | APPLICATION NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| August 13, 1986 | G2-27384 | G2-27384 P | |

NAME
City of Camas

| ADDRESS (STREET) | (CITY) | (STATE) | (ZIP CODE) |
|---|---|---|---|
| 616 NE 4th Avenue | Camas | Washington | 98607 |

*The applicant is, pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following described public waters of the State of Washington, subject to existing rights and to the limitations and provisions specified herein.*

## PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 9

TRIBUTARY OF (IF SURFACE WATERS)

| MAXIMUM CUBIC FEET PER SECOND | MAXIMUM GALLONS PER MINUTE | MAXIMUM ACRE-FEET PER YEAR |
|---|---|---|
| | 650 | 210 Supplemental |

| QUANTITY, TYPE OF USE, PERIOD OF USE | | |
|---|---|---|
| 210 acre-feet per year<br>Supplemental to existing rights | Municipal Supply | Year-round, as needed |

## LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION/WITHDRAWAL
600 feet south and 700 feet west of the north quarter corner of Section 4.

| LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) | SECTION | TOWNSHIP N. | RANGE, (E. OR W.) W.M. | W.R.I.A. | COUNTY |
|---|---|---|---|---|---|
| NE¼NW¼ | 4 | 1 | 3E | 28 | Clark |

## RECORDED PLATTED PROPERTY

| LOT | BLOCK | OF (GIVE NAME OF PLAT OR ADDITION) |
|---|---|---|
| | | |

## LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the City of Camas.

This permit is subject to the implementation of the minimum requirements established in the Interim Guidel for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology and Conserva Programs, July 1990.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphas in the management of the states water resources, and must be considered as a potential new source of wa Accordingly, as part of the terms of this permit, the applicant shall prepare and implement a water conserva plan approved by Department of Health. The standards for such a plan may be obtained from either Department of Health or the Department of Ecology.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the wa of the state in the best public interest. Use of water may be subject to regulation at certain times, based on necessity to maintain water quantities sufficient for preservation of the natural environment.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

# *REPORT OF EXAMINATION*

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regu... the Department of Ecology.)

☒ Ground Water (issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regu... the Department of Ecology.)

| PRIORITY DATE | APPLICATION NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| August 13, 1986 | G2-27384 | | |

NAME
City of Camas

| ADDRESS (STREET) | (CITY) | (STATE) | (ZIP CODE) |
|---|---|---|---|
| 616 NE 4th Avenue | Camas | Washington | 98607 |

## PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well No. 9

TRIBUTARY OF (IF SURFACE WATERS)

| MAXIMUM CUBIC FEET PER SECOND | MAXIMUM GALLONS PER MINUTE | MAXIMUM ACRE-FEET PER YEAR |
|---|---|---|
| | 650 | 210 Supplemental |

| QUANTITY, TYPE OF USE, PERIOD OF USE | | |
|---|---|---|
| 210 acre-feet per year<br>Supplemental to existing rights | Municipal Supply | Year-round, as needed |

## LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL
600 feet south and 700 feet west of the north quarter corner of Section 4.

| LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) | SECTION | TOWNSHIP N. | RANGE, (E. OR W.) W.M. | W.R.I.A. | COUNTY |
|---|---|---|---|---|---|
| NE¼NW¼ | 4 | 1 | 3E | 28 | Clark |

## RECORDED PLATTED PROPERTY

| LOT | BLOCK | OF (GIVE NAME OF PLAT OR ADDITION) |
|---|---|---|
| | | |

## LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by the City of Camas.

Existing City of Camas rights. The City of Camas has several surface and ground water rights and clair shown below:

Little Washougal River (reach now known as Boulder Creek), Certificate No. S 711 C, is for 1.0 cfs an acre-feet per year (AF/Y). This source is subject to low flow conditions in the summer.

Jones Creek, Certificate No. S 712 C, is for 2.5 cfs and 1820 AF/Y. This source goes low in the summer

Well No. 1, Claim No. 121022 for vested rights, is for 900 gpm and 320 AF/Y. The well is no longer use a regular basis.

Well No. 2, Claim No. 121023 for vested rights, is for 900 gpm and 230 AF/Y. The well is no longer use a regular basis.

Well No. 3, Certificate No. G 85-A C, is for 1200 gpm and 118 AF/Y.

Well No. 4, Certificate No. G 4072 C, is for 1325 gpm and 1208 AF/Y.

Well No. 5, Certificate No. G 6636 C, is for 600 gpm and 920 AF/Y.

Well No. 6, Certificate No. G 6635 C, is for 1500 gpm and 2400 AF/Y.

Well No. 7, Certificate No. G2-00501, is for 1000 gpm and 530 AF/Y.

Well No. 8, Certificate No. G2-24400, is for 900 gpm and 530 AF/Y.

Under the provisions of Certificates No. G2-00501C and G2-24400, the total annual quantity allowed u existing rights is 5,750 AF/Y.

Clark County Reservation. Under the provisions of Chapter 173-592 WAC, Reservation of Future Public W Supply for Clark County, ground water was reserved for future beneficial use for public water supply in C County. Since the enactment of this reservation, water rights issued pursuant to WAC 173-592 have rece a priority date of August 13, 1986, the effective date of said regulation. The total reservation quantity is 97 gpm and 65,300 AF/Y prorated by aquifer as follows:

1) Columbia River Alluvium (1A) and Sandy River Mudstone (1C) 77,000 gpm, 51,800 AF/Y;

2) Upper Troutdale (1B-2B) 20,000 gpm, 13,500 AF/Y.

The subject well is completed within the Upper Troutdale sediments. This appropriation, therefore, falls ur WAC 173-592 and will, when permitted, be debited against the reserved quantity for the Upper Trout aquifers. In addition, the permit will carry the August 13, 1986, priority date of the reservation.

Annual quantity supplemental to existing rights. The total annual allocation under the City's existing rig 5,750 AF/Y, was based on a projected population of 15,000. The City of Camas' actual water use for the y 1989 amounted to 1,930 acre-feet for a population of 6,600 (Clark County Coordinated Water system P Update, April 1991; Intergovernmental Resource Center population summary, March 1990).

The City's annual water use should remain within existing rights (5,750 AF/Y) for the foreseeable fut Therefore the annual quantity recommended for this permit will be supplemental to existing rights, augmen system supply within the 5,750 AF/Y already authorized.

Quantities from this well. Due to the apparent limitations of the aquifer, this well is probably not suitable use as a major production well, but it could serve to boost system capacity during peak periods. Mr. Levi requested that the permit authorize a maximum withdrawal of 650 gpm up to 20% of the time on average allow the City to determine the optimum rate and pumping schedule. Accordingly, the permit will autho 650 gpm and 210 AF/Y from Well 9, subject to the provisions below.

Water right certificate. Pursuant to RCW 90.03.330 and 90.44.080, a final certificate will be issued upo showing satisfactory to the Department that the appropriation has been perfected in compliance with the ter of the subject permit. The certificated withdrawal rate and annual quantity will reflect a sustainable yield a protection of senior rights, within the amounts specified on the permit. Monitoring and data submittal will required under the certificate as well as the permit.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the
of the state in the best public interest. Favorable consideration of this application has been based on suf
waters available, at least during portions of the year. However, it is pointed out to the applicant that th
of water may be subject to regulation at certain times, based on the necessity to maintain water qua
sufficient for preservation of the natural environment.

REPORTED BY: Vennie Wright DATE: October 12, 1992

The statutory permit fee for this application is $20.00.

STATE OF WASHINGTON
**DEPARTMENT OF ECOLOGY**
***REPORT OF EXAMINATION***

Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

[X] Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

| PRIORITY DATE | APPLICATION NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| August 21, 2003 | G2-30144 | | |

NAME

City of Camas

| ADDRESS (STREET) | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 616 NE Fourth Avenue | Camas | WA | 98607 |

**PUBLIC WATERS TO BE APPROPRIATED**

SOURCE

8 Wells (Lower Washougal Wellfield)

TRIBUTARY OF (IF SURFACE WATERS)

| MAXIMUM CUBIC FEET PER SECOND | MAXIMUM GALLONS PER MINUTE | MAXIMUM ACRE FEET PER YEAR |
|---|---|---|
| | 500 | 2,150 |

QUANTITY, TYPE OF USE, PERIOD OF USE

| | | |
|---|---|---|
| 2,150 acre-feet per year | Municipal | Year-round, as needed |

**LOCATION OF DIVERSION/WITHDRAWAL**

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

Well 5: 2600ft E & 790ft N of SW corner of Section 12, T1NR3E; Parcel=87268000; Lat=45.58059763; Long=122.38336343
Well 6: 2410ft E & 1795ft N of SW corner of Section 12, T1NR3E; Parcel=89927000; Lat=45.58340428; Long=122.38412204
Well 7: 1280ft E & 2110ft N of SW corner of Section 12, T1NR3E; Parcel=89891000; Lat=45.58431461; Long=122.38852327
Well 8: 1410ft E & 2080ft N of SW corner of Section 12, T1NR3E; Parcel=89888000; Lat=45.58426809; Long=122.38802699
Well 10: 790ft E & 2170ft N of SW corner of Section 12, T1NR3E; Parcel=89866000; Lat=45.58447735; Long=122.39044258
Well 11: 1060ft E & 2145ft N of SW corner of Section 12, T1NR3E; Parcel=89892000; Lat=45.58439709; Long=122.38937969
Well 12: 1030ft E & 2145ft N of SW corner of Section 12, T1NR3E; Parcel=89892000; Lat=45.58439492; Long=122.38950256
Well 13: 15ft E & 3410ft N of SW corner of Section 12, T1NR3E; Parcel=90928000; Lat=45.58783343; Long=122.39350782

| SMALLEST SUBDIVISION | SECTION | TOWNSHIP N. | RANGE, (E. OR W.) W.M. | W.R.I.A. | COUNTY |
|---|---|---|---|---|---|
| | 12 | 1 N | 3 E.W.M. | 28 | Clark |

| POINT OF WITHDRAWAL NAME | PARCEL NUMBER | LATITUDE | LONGITUDE | DATUM NAD 83 (orthophoto) |
|---|---|---|---|---|
| Washougal River Wellfield | See above | See above | See above | |

**RECORDED PLATTED PROPERTY**

| LOT | BLOCK | OF (GIVE NAME OF PLAT OR ADDITION) |
|---|---|---|
| | | |

**LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED**
[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

Area served by the City of Camas. The place of use of this water right is the service area described in the currently approved Water System Plan as approved by the Washington State Department of Health. RCW 90.03.386 may have the effect of revising the place of use of this water right if the criteria in section RCW 90.03.386(2) are met.

## DESCRIPTION OF PROPOSED WORKS

8 Existing Wells in the Lower Washougal Wellfield

## DEVELOPMENT SCHEDULE

| BEGIN PROJECT BY THIS DATE: | COMPLETE PROJECT BY THIS DATE: | WATER PUT TO FULL USE BY THIS DATE: |
|---|---|---|
| August 1, 2008 | August 1, 2015 | August 1, 2025 |

## PROVISIONS

**Monitoring**

The City of Camas shall develop a monitoring plan that includes the following:

a.) Monitor water levels in existing wells (TW-C and Well 4) and three new monitoring wells. The new monitoring wells must be installed as a cluster in the lower Washougal River in general proximity to the Georgia Pacific wellfield (where the largest drawdown occurs in the area). Two wells must be completed in the lower permeability streambed unit that lies beneath the river, and the third well must be completed in the more permeable PAA aquifer. All water levels must be measured to the nearest tenth of a foot, on an hourly basis during baseflow periods. New monitoring wells must be accurately located within 10 feet horizontally and 0.1 foot vertically. All monitoring wells must be constructed according to WAC 173-160-400.

b.) The City shall install a continuous river stage monitoring station in vicinity of the new monitoring wells. The monitoring station must include a staff gage which is accurately located within 10 feet horizontally and 0.1 foot vertically. Stage readings shall also be recorded on an hourly basis.

c.) Aquifer tests on the new Camas production wells must coincide with summer/fall low-flow periods and include seepage surveys during testing events. New supply wells must be accurately located within 10 feet horizontally and 0.1 foot vertically.

d.) The City shall submit water level data from their monitoring network for the previous year by January 31 to the Department of Ecology. Data shall be provided in a digital format along with a two page summary attached. A more thorough monitoring report must be provided after 5 years from the date of issuance of this water right or when this permit is perfected (whichever comes first), to further evaluate the effects of pumping on the Washougal River.

**Operations of Surface Water System**

1. Prior to groundwater being withdrawn under this water right, the City of Camas must cease their surface water diversions from Jones and Boulder Creeks between May 15 and October 31 of each year. At the State's discretion, the water rights associated with these diversions will be placed into the State's Trust Water Program as permanent, seasonal donations.

**Metering and Reporting Diversions**

1. An approved measuring device shall be installed and maintained for each of the wells authorized by this water right, in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173.

2. Reported water use data shall be submitted via the Internet. To set up an Internet reporting account, access https://fortress.wa.gov/ecy/wrx/wrx/Meteringx/. If you do not have Internet access, contact the Southwest Regional Office for forms to submit your data.

3. Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation, and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements."

4. Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions and may inspect, at reasonable times, any measuring device used to meet the above conditions.

**Development Schedule**

1. The development schedule shall be as follows:

   - Construction shall begin by August 1, 2008

STATE OF WASHINGTON
**DEPARTMENT OF ECOLOGY**
***REPORT OF EXAMINATION***

Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

[X] Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

| PRIORITY DATE | APPLICATION NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| August 21, 2003 | G2-30145 | | |

NAME
City of Camas

| ADDRESS (STREET) | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 616 NE Fourth Avenue | Camas | WA | 98607 |

**PUBLIC WATERS TO BE APPROPRIATED**

SOURCE
Proposed Well (Anderson Site)

TRIBUTARY OF (IF SURFACE WATERS)

| MAXIMUM CUBIC FEET PER SECOND | MAXIMUM GALLONS PER MINUTE | MAXIMUM ACRE FEET PER YEAR |
|---|---|---|
| | 1000 | 880 |

QUANTITY, TYPE OF USE, PERIOD OF USE

| | | |
|---|---|---|
| 880 acre-feet per year | Municipal | Year-round, as needed |

**LOCATION OF DIVERSION/WITHDRAWAL**

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

1900 feet north and 2050 feet west of SE corner of Section 12

| SMALLEST SUBDIVISION | SECTION | TOWNSHIP N. | RANGE, (E. OR W.) W.M. | W.R.I.A. | COUNTY |
|---|---|---|---|---|---|
| NW 1/4 SE 1/4 | 12 | 1 N | 3 E.W.M. | 28 | Clark |

| POINT OF WITHDRAWAL NAME | PARCEL NUMBER | LATITUDE | LONGITUDE | DATUM |
|---|---|---|---|---|
| Anderson proposed well | 91045003 | 45.58349161 | 122.38087177 | NAD 83 (orthophoto) |

**RECORDED PLATTED PROPERTY**

| LOT | BLOCK | OF (GIVE NAME OF PLAT OR ADDITION) |
|---|---|---|
| | | |

**LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED**
[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

Area served by the City of Camas. The place of use of this water right is the service area described in the currently approved Water System Plan as approved by the Washington State Department of Health. RCW 90.03.386 may have the effect of revising the place of use of this water right if the criteria in section RCW 90.03.386(2) are met.

## DESCRIPTION OF PROPOSED WORKS

A proposed well

## DEVELOPMENT SCHEDULE

| BEGIN PROJECT BY THIS DATE: | COMPLETE PROJECT BY THIS DATE: | WATER PUT TO FULL USE BY THIS DATE: |
|---|---|---|
| August 1, 2008 | August 1, 2015 | August 1, 2025 |

## PROVISIONS

**Monitoring**

The City of Camas shall develop a monitoring plan that includes the following:

a.) Monitor water levels in existing wells (TW-C and Well 4) and three new monitoring wells. The new monitoring wells must be installed as a cluster in the lower Washougal River in general proximity to the Georgia Pacific wellfield (where the largest drawdown occurs in the area). Two wells must be completed in the lower permeability streambed unit that lies beneath the river, and the third well must be completed in the more permeable PAA aquifer. All water levels must be measured to the nearest tenth of a foot, on an hourly basis during baseflow periods. New monitoring wells must be accurately located within 10 feet horizontally and 0.1 foot vertically. All monitoring wells must be constructed according to WAC 173-160-400.

b.) The City shall install a continuous river stage monitoring station in vicinity of the new monitoring wells. The monitoring station must include a staff gage which is accurately located within 10 feet horizontally and 0.1 foot vertically. Stage readings shall also be recorded on an hourly basis.

c.) Aquifer tests on the new Camas production wells must coincide with summer/fall low-flow periods and include seepage surveys during testing events. New supply wells must be accurately located within 10 feet horizontally and 0.1 foot vertically.

d.) The City shall submit water level data from their monitoring network for the previous year by January 31 to the Department of Ecology. Data shall be provided in a digital format along with a two page summary attached. A more thorough monitoring report must be provided after 5 years from the date of issuance of this water right or when this permit is perfected (whichever comes first), to further evaluate the effects of pumping on the Washougal River.

**Operations of Surface Water System**

1. Prior to groundwater being withdrawn under this water right, the City of Camas must cease their surface water diversions from Jones and Boulder Creeks between May 15 and October 31 of each year. At the State's discretion, the water rights associated with these diversions will be placed into the State's Trust Water Program as permanent, seasonal donations.

**Metering and Reporting Diversions**

1. An approved measuring device shall be installed and maintained for each of the wells authorized by this water right, in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173.

2. Reported water use data shall be submitted via the Internet. To set up an Internet reporting account, access https://fortress.wa.gov/ecy/wrx/wrx/Meteringx/. If you do not have Internet access, contact the Southwest Regional Office for forms to submit your data.

3. Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation, and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements."

4. Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions and may inspect, at reasonable times, any measuring device used to meet the above conditions.

**Development Schedule**

1. The development schedule shall be as follows:

STATE OF WASHINGTON
**DEPARTMENT OF ECOLOGY**
***REPORT OF EXAMINATION***

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

| PRIORITY DATE | APPLICATION NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| August 21, 2003 | G2-30146 | | |

NAME
City of Camas

| ADDRESS (STREET) | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 616 NE Fourth Avenue | Camas | WA | 98607 |

**PUBLIC WATERS TO BE APPROPRIATED**

SOURCE
Proposed Well (Parkers Landing)

TRIBUTARY OF (IF SURFACE WATERS)

| MAXIMUM CUBIC FEET PER SECOND | MAXIMUM GALLONS PER MINUTE | MAXIMUM ACRE FEET PER YEAR |
|---|---|---|
| | 1000 | 880 |

QUANTITY, TYPE OF USE, PERIOD OF USE

| | | |
|---|---|---|
| 880 acre-feet per year | Municipal | Year-round, as needed |

**LOCATION OF DIVERSION/WITHDRAWAL**

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

200 feet north and 2500 feet west of the SE corner of Section 12

| SMALLEST SUBDIVISION | SECTION | TOWNSHIP N. | RANGE, (E. OR W.) W.M. | W.R.I.A. | COUNTY |
|---|---|---|---|---|---|
| SW 1/4 SE 1/4 | 12 | 1 N | 3 E.W.M. | 28 | Clark |

| POINT OF WITHDRAWAL NAME | PARCEL NUMBER | LATITUDE | LONGITUDE | DATUM |
|---|---|---|---|---|
| Parkers Landing proposed well | 73134162 | 45.57960601 | 122.38210695 | NAD 83 (orthophoto) |

**RECORDED PLATTED PROPERTY**

| LOT | BLOCK | OF (GIVE NAME OF PLAT OR ADDITION) |
|---|---|---|
| | | |

**LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED**
[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

Area served by the City of Camas. The place of use of this water right is the service area described in the currently approved Water System Plan as approved by the Washington State Department of Health. RCW 90.03.386 may have the effect of revising the place of use of this water right if the criteria in section RCW 90.03.386(2) are met.

## DESCRIPTION OF PROPOSED WORKS

A proposed well

## DEVELOPMENT SCHEDULE

| BEGIN PROJECT BY THIS DATE: | COMPLETE PROJECT BY THIS DATE: | WATER PUT TO FULL USE BY THIS DATE: |
|---|---|---|
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## PROVISIONS

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b.) The City shall install a continuous river stage monitoring station in vicinity of the new monitoring wells. The monitoring station must include a staff gage which is accurately located within 10 feet horizontally and 0.1 foot vertically. Stage readings shall also be recorded on an hourly basis.

c.) Aquifer tests on the new Camas production wells must coincide with summer/fall low-flow periods and include seepage surveys during testing events. New supply wells must be accurately located within 10 feet horizontally and 0.1 foot vertically.

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**Operations of Surface Water System**

1. Prior to groundwater being withdrawn under this water right, the City of Camas must cease their surface water diversions from Jones and Boulder Creeks between May 15 and October 31 of each year. At the State's discretion, the water rights associated with these diversions will be placed into the State's Trust Water Program as permanent, seasonal donations.

**Metering and Reporting Diversions**

1. An approved measuring device shall be installed and maintained for each of the wells authorized by this water right, in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173.

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| PRIORITY DATE | APPLICATION NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| August 21, 2003 | G2-30147 | | |

NAME

City of Camas

| ADDRESS (STREET) | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 616 NE Fourth Avenue | Camas | WA | 98607 |

**PUBLIC WATERS TO BE APPROPRIATED**

SOURCE

Proposed Well (Treatment Plant Well)

TRIBUTARY OF (IF SURFACE WATERS)

| MAXIMUM CUBIC FEET PER SECOND | MAXIMUM GALLONS PER MINUTE | MAXIMUM ACRE FEET PER YEAR |
|---|---|---|
| | 1000 | 880 |

QUANTITY, TYPE OF USE, PERIOD OF USE

880 acre-feet per year | Municipal | Year-round, as needed

**LOCATION OF DIVERSION/WITHDRAWAL**

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL

200 feet north and 200 feet west of the SW corner of Section 12

| SMALLEST SUBDIVISION | SECTION | TOWNSHIP N. | RANGE, (E. OR W.) W.M. | W.R.I.A. | COUNTY |
|---|---|---|---|---|---|
| SW 1/4 SW ¼ | 12 | 1 N | 3 E.W.M. | 28 | Clark |

| POINT OF WITHDRAWAL NAME | PARCEL NUMBER | LATITUDE | LONGITUDE | DATUM |
|---|---|---|---|---|
| Treatment Plant proposed well | 87360000 | 45.57902697 | 122.39273145 | NAD 83 (orthophoto) |

**RECORDED PLATTED PROPERTY**

| LOT | BLOCK | OF (GIVE NAME OF PLAT OR ADDITION) |
|---|---|---|
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**Development Schedule**

1. The development schedule shall be as follows:

RECEIVED
SEP 04 2001

# State of Washington
# Application for a Water Right

Please follow the attached instructions to avoid unnecessary delays.

For Ecology Use
Fee Paid _____
Date _____

## Section 1. APPLICANT - PERSON, ORGANIZATION, OR WATER SYSTEM

Name City of Camas Home Tel:( ) -
Mailing Address 616 NE 4th Ave. Work Tel:( 360 ) 834 - 3451
City Camas State WA Zip+4 98607 + FAX:( 360 ) 834 - 1535

## Section 2. CONTACT - PERSON TO CALL ABOUT THE APPLICATION

☐ Same as above

Name Eric Levison Home Tel:( ) -
Mailing Address 616 NE 4th Ave. Work Tel:( 360 ) 834 - 3451
City Camas State WA Zip+4 98607 + FAX:( 360 ) 834 - 1535
Relationship to applicant Engineering Manager - City of Camas

## Section 3. STATEMENT OF INTENT

Municipal

The applicant requests a permit to use not more than 1,000 ( ☒ gallons per minute or ☐ cubic feet per second) from a ☐ surface water source or ☒ ground water source (check only one) for the purpose(s) of Domestic/Public Supply. **ATTACH A "LEGAL" DESCRIPTION OF THE PLACE OF USE.** (See instructions.) *NOTE: A tax parcel number or a plat number is not sufficient.* Area served by City of Camas.
Estimate a maximum annual quantity to be used in acre-feet per year: 1200 AF/YR

☐ Check if the water use is proposed for a short-term project. Indicate the period of time that the water will be needed:
From ___/___/___ to ___/___/___

## Section 4. WATER SOURCE

| If SURFACE WATER | If GROUNDWATER |
|---|---|
| Name the water source and indicate if stream, spring, lake, etc. If unnamed, write "unnamed spring," "unnamed stream," etc.. Number of diversions: | A permit is desired for 2 well(s). |
| Source flows into (name of body of water): | Size & depth of well(s): 12-inch deep 150 feet deep |

LOCATION

Enter the north-south and east-west distances in feet from the point of diversion or withdrawal to the nearest section corner: 1600 feet east and 1000 feet south of the NW 1/4 of Section 28, Township 2 North, Range 3 East

| ¼ of | ¼ of | Section | Township | Range(E/W) | County | If location of source is platted, complete below: Lot | Block | Subdivision |
|---|---|---|---|---|---|---|---|---|
| NE | NW | 28 | 2N | 3E | Clark | | | |
| | | | | | | | | |

For Ecology Use Date Received: 9-4-01 Priority Date: 9-4-01
SEPA: Exempt/Not Exempt FERC License # Dept. Of Health #
Date Accepted As Complete 9-21-01 By SC Date Returned By WRIA: 28

EGY 040-1-14
Rev. 9/95 F

**APPLICATION**

Appl. No.: G2-30019

Q 3-3201A

98

## Section 5. GENERAL WATER SYSTEM INFORMATION

A. Name of system, if named: Camas Municipal Water-Sewer System

B. Briefly describe your proposed water system. (See instructions.)

Two 12-inch supply wells will be constructed to depths of 150 feet. The wells will be used to provide water supply to municipal and industrial water users that are served by the City of Camas in the Lacamas Basin area. See 1996 Water System Plan documents for other related water system information.

C. Do you already have any water rights or claims associated with this property or system? ☒ YES ☐ NO
PROVIDE DOCUMENTATION. See list of City Water Rights and claims that are attached.

## Section 6. DOMESTIC / PUBLIC WATER SUPPLY SYSTEM INFORMATION
*(Completed for all domestic/public supply uses.)*

A. Number of "connections" requested: 4896 (current number of connections) Type of connection Municipal Industrial Hookup (Homes, Apartment, Recreational, etc.)

B. Are you within the area of an approved water system? ☒ YES ☐ NO
If yes, explain why you are unable to connect to the system. *Note: Regional water systems are identified by your County Health Department.* The applicant (City of Camas) is the regional water provider.

**Complete C. and D. only if the proposed water system will have fifteen or more connections.**

C. Do you have a current water system plan approved by the Washington State Department of Health? ☒ YES ☐ NO
If yes, when was it approved? 1996 Please attach the current approved version of your plan.
Note: City is currently updating water system plan. New plan should be approved in early 2002.

D. Do you have an approved conservation plan? ☒ YES ☐ NO
If yes, when was it approved? 1996 Please attach the current approved version of your plan.
Note: Water Conservation Plan incorporated into 1996 Water System Plan, which is currently being updated.

## Section 7. IRRIGATION/AGRICULTURAL/FARM INFORMATION
*(Complete for all irrigation and agriculture uses.)* N/A

A. Total number of acres to be irrigated: _____

B. List total number of acres for other specified agricultural uses:

Use _____ Acres _____
Use _____ Acres _____
Use _____ Acres _____

C. Total number of acres to be covered by this application: _____

D. Family Farm Act (Initiative Measure Number 59, November 3, 1977)
Add up the acreage in which you have a controlling interest, including only:
‡ Acreage irrigated under water rights acquired after December 8, 1977;
‡ Acreage proposed to be irrigated under this application;
‡ Acreage proposed to be irrigated under other pending application(s).

1. Is the combined acreage greater than 2000 acres? ☐ YES ☐ NO
2. Do you have a controlling interest in a Family Farm Development Permit? ☐ YES ☐ NO
If yes, enter permit no: _____

E. Farm uses:
Stockwater - Total # of animals _____ Animal type _____ (If dairy cattle, see below)
Dairy - # Milking _____ # Non-milking _____

## Section 8. WATER STORAGE

Will you be using a dam, dike, or other structure to retain or store water? ☐ YES ☒ NO

*NOTE: If you will be storing 10 acre-feet or more of water and/or if the water depth will be 10 feet or more at the deepest point, and some portion of the storage will be above grade, you must also apply for a reservoir permit. You can get a reservoir permit application from the Department of Ecology.*

## Section 9. DRIVING DIRECTIONS

Provide detailed driving instructions to the project site. From Lacey, WA, go southbound on I-5. Take I-205 exit at Hazel Dell. Proceed southbound on I-205 to SR-14. Take SR-14 eastbound to Brady Road. Proceed north on Brady Road which turns into NW Parker Avenue. Continue northbound on NW Parker to SE 1st Street. Go westbound on NW 1st to 216th Ave. Take 216th Ave. northbound to Camas Meadows Golf Course. Take service road through golf course to well site.

## Section 10. REQUIRED MAP

A. Attach a map of the project. (See instructions.)

## Section 11. PROPERTY OWNERSHIP

A. Does the applicant own the land on which the water will be used? ☐ YES ☒ NO
If no, explain the applicant's interest in the place of use and provide the name(s) and address(es) of the owner(s):

The City will use the water for supply within their service area.

B. Does the applicant own the land on which the water source is located? ☐ YES ☒ NO
If no, submit a copy of agreement:
The City will purchase property as part of the supply well development.

**I certify that the information above is true and accurate to the best of my knowledge. I understand that in order to process my application, I grant staff from the Department of Ecology access to the site for inspection and monitoring purposes. Even though I may have been assisted in the preparation of the above application by the employees of the Department of Ecology, all responsibility for the accuracy of the information rests with me.**

CITY OF CAMAS E. Levison ERIC LEVISON — 8/29/01
Applicant (or authorized representative) — Date

Landowner for place of use (if same as applicant, write "same") — Date

**Use this page to continue your answers to any questions on the application. Please indicate section number before answer.**

| We are returning your application for the following reason(s): | |
|---|---|
| _____ Examination fee was not enclosed | APPLICANT PLEASE RETURN TO CASHIER, PO BOX 5128, LACEY, WA 98509-5128 |
| _____ Section number(s) _____ is/are incomplete | APPLICANT PLEASE RETURN TO THE APPROPRIATE REGIONAL OFFICE |
| Explanation: | |
| *Please provide the additional information requested above and return your application by* _____ _____ *(date).* | |

Ecology staff_____ Date_____

To receive this document in alternative format, contact Lisa Newman at (360) 407-6604 (Voice) or (360) 407-6006 (TDD).

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 1, 2001

City of Camas
Attn Eric Levison
616 NE 4th Avenue
Camas WA 98607

Re: Water Right Application No. G2-30018

This letter is to acknowledge that the Washington State Department of Ecology received your water right application. We have assigned your application the number indicated above. Please include this number in future correspondence regarding your application with the Department of Ecology.

When we begin actively evaluating applications in your area, we will prepare a public notice and send it to you with publication instructions. It will be sometime before we are able to begin working in your area. In the meantime, please notify Ecology of changes such as address, property ownership, or variations in your proposed water use plans.

The availability of water in Washington state is a serious problem. Much of the water in our state has already been appropriated. The competition for water has escalated with our state's increasing population, conflicting water policy issues, and grave declines in salmon and other fish populations. A new watershed management law brings us a step closer to addressing some of these issues. It sets into motion a locally based process to address water quantity, quality, and habitat issues. Watershed management will help meet challenges for getting water to people, industries, farms, and fish.

In some areas of the state, we are continuing to evaluate applications within watersheds where we have previously gathered information and completed watershed assessments. We are also continuing to process water right permit or change applications that are intended to address public health and safety emergencies, the natural environment, or are for nonconsumptive withdrawals. All other applications are grouped by watershed and processed according to the date of submittal, and when we have enough information and staff resources to make decisions.

If you would like further information on your application, please contact the Southwest Regional Office at (360) 407-0240.

Sincerely,

*J. Mike Harris*

J. Mike Harris
Water Resources Supervisor
Southwest Regional Office

JMH:th (applet.doc)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 1, 2001

City of Camas
Attn Eric Levison
616 NE 4th Avenue
Camas WA 98607

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Sincerely,

*J. Mike Harris*

J. Mike Harris
Water Resources Supervisor
Southwest Regional Office

JMH:th (applet.doc)

CITY OF CAMAS
616 Northeast Fourth Avenue
P.O. Box 1055
Camas, Washington 98607
http://www.ci.camas.wa.us



August 29, 2001

DEPARTMENT OF PUBLIC WORKS

Mr. Mike Harris
Department of Ecology
300 Desmond Drive
P.O. Box 47600
Olympia, WA 98504-7600

***Subject:*** ***Water Right Application Submittals***
***City of Camas***

Dear Mr. Harris:

Enclosed you will find two water right applications along with the statutory examination fee of $10.00 for each water right application (total of $20.00). The enclosed applications are for new water supply sources in the Lacamas Basin.

The City of Camas would like to develop three new supply wells under these applications to meet the rapid growth, which is occurring in the western portion of our service area. We recently completed an extensive test well drilling program in this area. The results of the exploratory drilling and aquifer testing are summarized in the attached report titled *City of Camas, Westside Test Well Drilling Program (PGG, 2001).*

At your convenience, we would like to schedule a meeting with you and your staff to discuss the results of our test well program and strategies for obtaining water right permits for new production wells.

We appreciate your assistance on this matter.

Sincerely,

Eric Levison
Engineering Manager

Enclosures: Water Right Applications

rls:g:\pworks\eric\harris 082901.doc

Printed By: Dawn Merryman
On: 09/07/2001 At: 10:10 am

# RECEIPT

Receipt Number **02-005123**

**Department of Ecology (4610)**
**PO Box 5128**
**Lacey, WA 98509-5128**
**(360) 407-7095**

Current Document Number **461G0355CJ** Date **09/10/2001** FM **03**

Remitter Name **CAMAS CITY** Receipt Name

Check/Draw Number **4149**
Document Amount **$20.00**
Method of Payment **Check**
Comment Description **WATER RIGHTS**

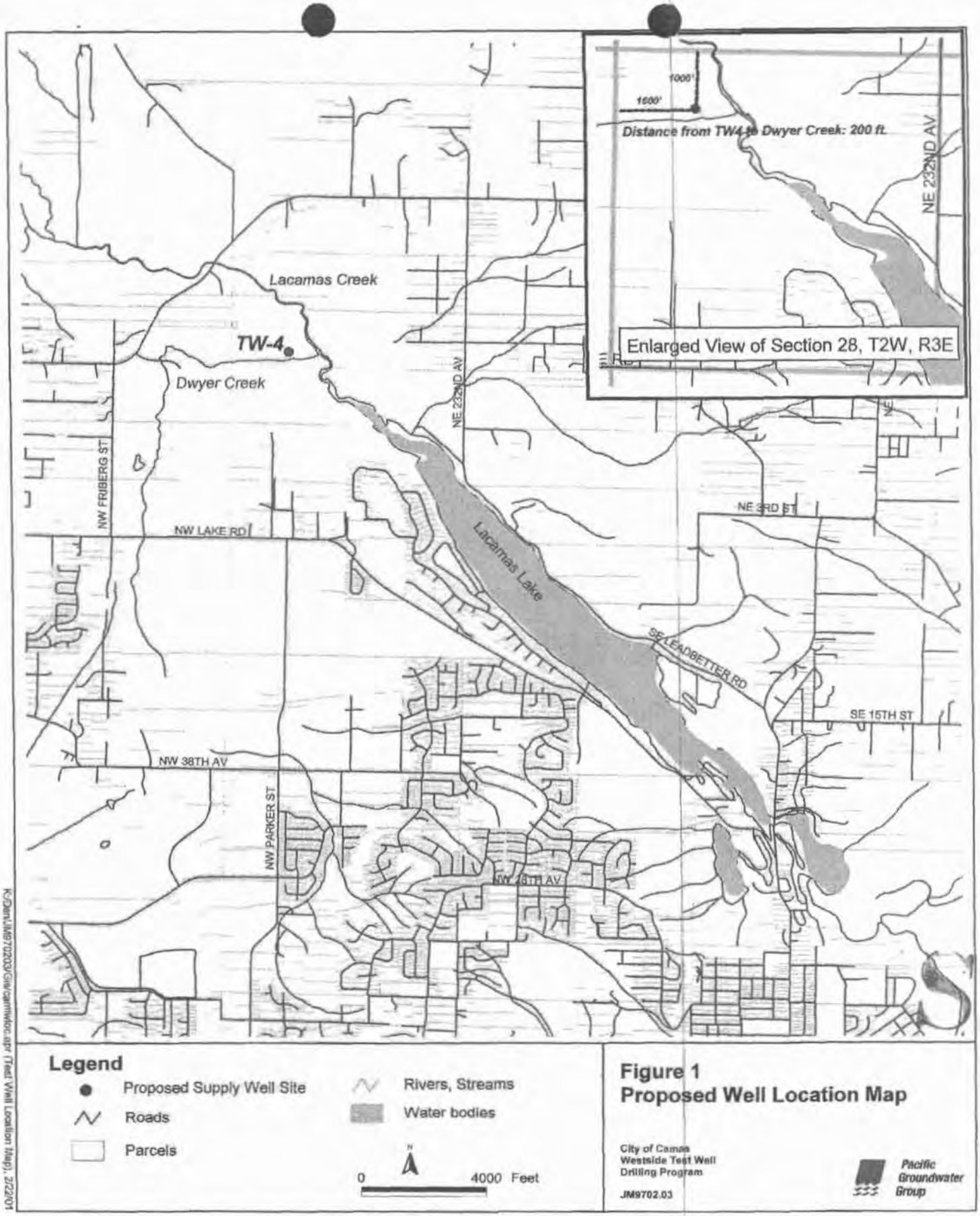
| Ref Doc Nr | Ref Doc Sfx | Inv Nr | Id Nr | Prgm Cd | T C | R | Fund | Maj Grp | Maj Src | Sub Src | Cnty | Work Cls | PIC | AI | Org | Prj | Sub Prj | Prj Phs | Sub Obj | Sub Sub Obj | Var GL | Sub Sid Dr | Sub Sid Cr | Alloc Amt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | H00 | 001 | | 001 | 02 | 85 | 000010 | | | | | | | | | | | | | | $20.00 |

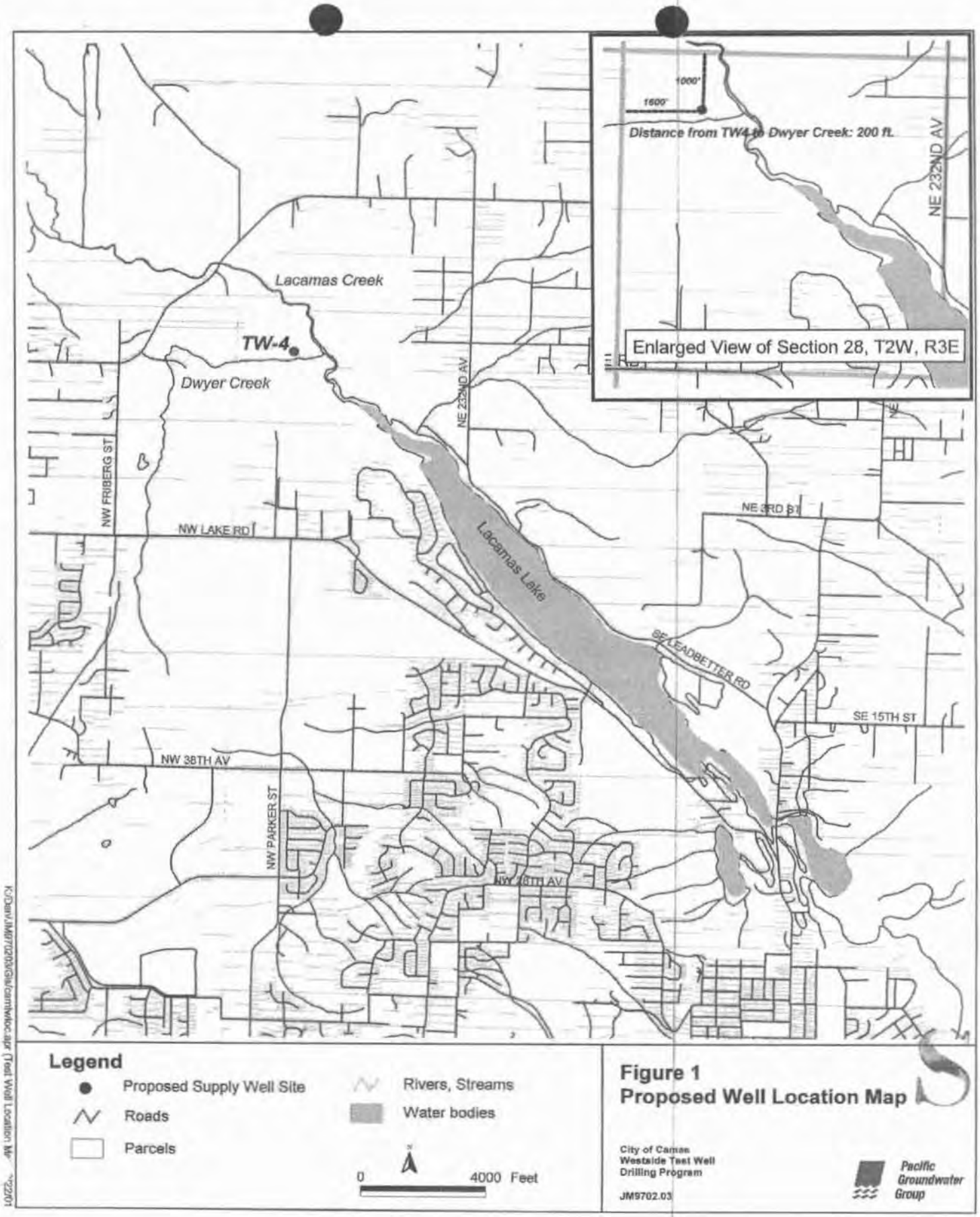
# TABLE 1-3

## City of Camas Water Right Summary

| Source | Location of Diversion | Identification Number | Priority Date | Instantaneous Quantity $Q_i$ (gpm) | Annual Quantity $Q_a$ (ac-ft/yr.) |
|---|---|---|---|---|---|
| **Claims** | | | | | |
| Well No. 1 | 2159 ft. N, 667 ft. E, from the SW corner, S12, T1N, R3E | 121022 | 6/11/74 | 900 | 320(1) |
| Well No. 2 | 2152 ft. N, 731 ft. E, from the SW corner, S12, T1N, R3E | 121023 | 6/11/74 | 900 | 230(1) |
| **Certificates** | | | | | |
| Boulder Creek | (need this info) | S 712 C | 8/22/23 | 1120 [2.5 cfs] | 1820(2) (P) |
| Jones Creek | SE1/4, SW1/4, S3, T2N,R4E | S 711 C | 9/5/30 | 450 [1.0 cfs] | 730(3) (P) |
| Well No. 3 | NW1/4, SW1/4, S12,T1N, R3E | G 85-A C | 7/21/45 | 1200 | 118 (P) |
| Well No. 4 | W1/2, NW1/4, S12, T1N, R3E | G 4072-A C | 2/12/59 | 1325 | 1208 (S) |
| Well No. 5 | Lot 9 of Orchard Homes, 2760 ft. E, 840 ft. N from SW corner, S12, T1N, R3E | G 6636-A C | 3/22/68 | 600 | 920(4) (P) |
| Well No. 6 | 2300 ft. E, 1800 ft. N from SW corner, S12, T1N, R3E | G 6635-A C | 3/22/68 | 1500 | 2400(4) (P) |
| Well No. 7 | 1245 ft. E, 2145 ft. N from SW corner, S12, T1N, R3E | G2-00501 C | 3/22/71 | 1000 | 530(5) (P) |
| Well No. 8 | 1375 ft. E, 2145 ft. N from SW corner, S12, T1N, R 3E | G2-24400 C | 2/4/77 | 900 | 530(5) (P) |
| **Permits** | | | | | |
| ~~Well No. 9~~ | ~~600 ft. S, 700 ft. W from N1/4 corner, S4, T1N, R3E~~ | ~~G4-27384 P~~ | ~~8/13/86~~ | ~~650~~ | ~~210(5) (S)~~ |
| **Total** | Sum of all existing water right certificates and permits. **These values do not include claims.** | | | **SW = 1570 gpm<br>GW = 7175 gpm<br>Total = 8745 gpm** | **SW = 2550 ac-ft.<br>GW = 3200 ac-ft.<br>Total = 5750 ac-ft.** |

(1) Claims must go through an adjudication procedure in state court to determine validity.
(2) This source was formerly known as the Little Washougal River. The certificate refers to an instantaneous quantity ($Q_i$) and does not specify an annual withdrawal. A DOE Report of Examination for Well No. 7 (G2-00501 C) summarizes existing water rights including 1820 ac-ft/yr. for Boulder Creek (S 712 C) based on continuous withdrawal at the instantaneous right specified.
(3) The certificate refers to an instantaneous quantity ($Q_i$) and does not specify an annual withdrawal. A DOE Report of Examination for Well No. 7 (G2-00501 C) summarizes existing water rights including 730 ac-ft/yr. for Jones Creek (S 711 C) based on continuous withdrawal at the instantaneous right specified.
(4) The Permit and Report of Examination preceding this certificate limited water rights to "the total quantity withdrawn or diverted from all sources is not to exceed 3300 ac-ft/yr."
(5) The Permit and Report of Examination preceding this certificate provided for "the total amount of water to be withdrawn or diverted, which includes the amounts as approved in Surface Water Certificates No. 711 and 712 and Ground Water Certificates No. 85,4072, 6635, 6636, shall not exceed 5750 ac-ft/yr."
(P) Primary water right, additive to other rights.
(S) Supplemental water right, not additive or considered when summing a cumulative total of all rights.


1000'
1500'
Distance from TW4 to Dwyer Creek: 200 ft.
NE 232ND AV
Enlarged View of Section 28, T2W, R3E
Lacamas Creek
TW-4
Dwyer Creek
NW FRIBERG ST
NE 232ND AV
NW LAKE RD
NE 3RD ST
Lacamas Lake
SE LEADBETTER RD
SE 15TH ST
NW 38TH AV
NW PARKER ST
NW 28TH AV
Legend
Proposed Supply Well Site
Roads
Parcels
Rivers, Streams
Water bodies
N
0
4000 Feet
Figure 1
Proposed Well Location Map
City of Camas
Westside Test Well
Drilling Program
JM9702.03
Pacific Groundwater Group
K:\Data\JM9702\03\siw\camwloc.apr (Test Well Location Map), 2/22/01




K:\Dwg\JM9702\GIS\arcmtwloc.apr (Test Well Location Map)

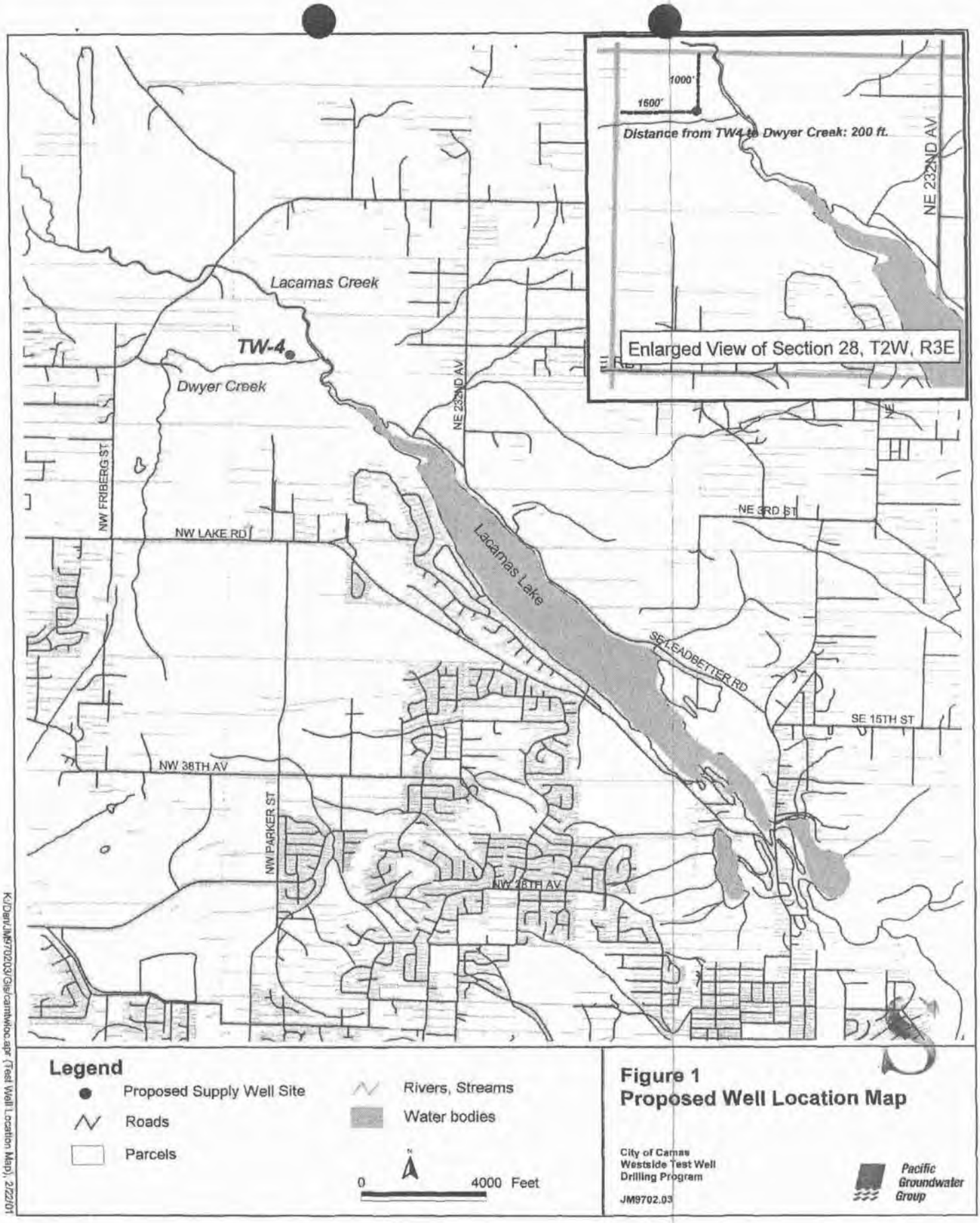



**Figure 1**
**Proposed Well Location Map**

City of Camas
Westside Test Well
Drilling Program

JM9702.03

Pacific Groundwater Group

K:\Dart\JM9702\03\Site\camtwloc.apr (Test Well Location Map), 2/22/01

Account Transfers | Recurring Transfers | Third-Party Transfers | External Transfers
IRA/ESA Certificate Add-On

Third Party Transfer Confirmation

Transfer of funds successfully completed. See the new account balances below.

| | |
|---|---|
| **From Account:** | Share Savings 1274297009 KENNETH C ALEXANDER |
| **From Account Balance:** | $14.25 |
| **To Account:** | EveryDay Checking 1274297710 ERNESTINE P ALEXANDER |
| **Payment Amount:** | $3,325.00 |
| **Effective Date:** | 03/09/2009 |
| **Confirmation Number:** | 304756 |

Print Receipt

ROTORK CONTROLS, INC.
SCOPE OF WORK
START UP/COMMISSIONING OF ROTORK ACTUATORS

JOB SITE LOCATION: WARDEN, WASHINGTON

Rotork Field Engineer will:

1. Inspect all installed Rotork actuators for proper orientation.
2. Inspect all installed Rotork actuators for proper wiring terminations.
3. Electrically power up Rotork actuators and perform initial programming.
4. Set both the Open and Closed limits on the Rotork actuators.
5. Electrically stroke all valves with Rotork actuators to ensure proper operation.
6. Provide customer with the Field Service Report for their records.
7. Correct any discrepancies found during this course of work.

rotork
factory service

2180 South Mc Dowell Blvd. Suite B
Petaluma, CA 94954
Phone: (707) 769-4880
Fax: (707) 769-4888

# Service Report

**Job No.:**
**Engineer:**
**Date:**
**Site:**

**Site Contact:**
**Phone Number:**
**Date Service Performed:**
**PO Number:**
**Type of Service:**

| | | | | |
|---|---|---|---|---|
| **Serial Number:** | **Type:** | **WD:** | **RPM:** | **Volts:** |
| **Gearbox Type:** | **Valve Type:** | | **Service Type:** | **Valve Tag No:** |

***Reported Problem:***

***Work Completed:***

***If there is additional work needed, please explain:***

# Rotork Site Training Syllabus (for IQT)

**I. Introduction to Rotork**

A. Tech introduction
B. Rotork Controls, Inc.
C. Types and models of actuators. Sizing, classifications. Nameplates.
D. Documentation, Rotork.com
   1) IQT- E110, E120, E175, E185, Wiring diagrams

**II. IQT**

A. Nomenclature and parts ID.
   1) Gearcase, center column, drive bushings, battery, seals and o-rings.
   2) Motor & wormwheel, resolver.
   3) Handwheel, hand/auto lever, H/A cover.
   4) Electronics- Cover (UV Window/ local controls), main pcb, power module, motor control pcb
   5) Options, if applicable

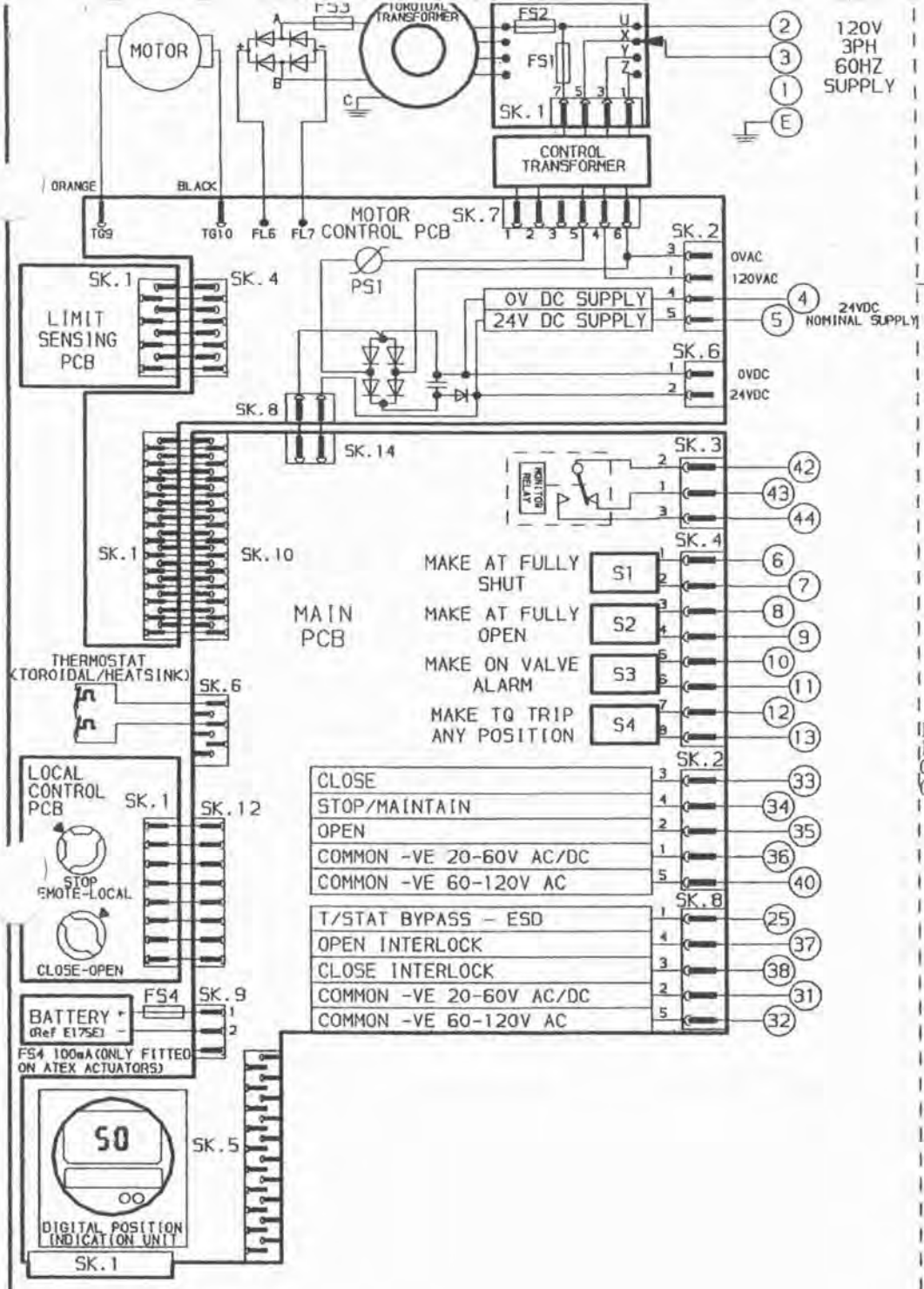
**III. Operation, set-up and calibration (using live demo actuator)**

A. Manual operation B. Setting tool and display
C. Menu structure and functions
   1) Torque display, password screen
   2) Primary functions- open/close action, torque setting, limit setting.
   3) Secondary functions-Indication, ESD(emerg shut down), options, IQT type and speed.
D. Local operation
E. Remote operation
   1) Remote voltage supplies 2) Remote control configurations 3) Network options
F. Installation and adaption
G. Troubleshooting
   1) Alarms 2) Help screens 3) Common faults and checks
H. Maintenance - 1) Lubrication 2) inspection 3) spares

**IV. Advanced Functions and Utilities (using laptop and PDA)**

A. Insight
B. Configuration Files
C. Datalogger files
   1) Torque profiles (for baseline files/trending, torque issues)
   2) Event logging and review

**V. Conclusion- Review and Follow-up**




## RWS300

### TRANSFORMER TAPPING

TYPE 1

| TAP | NOM | RANGE |
|---|---|---|
| Z | 120 | 96-144 |
| FS1-250mA A/S<br>FS2-5A A/S | | |

FUSE FS3 - 20A ATO FAST ACTING

PS1 SELF RESETTING FUSE

### NOTE

REFER TO PUBLICATION E175E FOR APPROVED FUSES FS1, FS2 AND FS3.

MAX EXTERNAL LOAD ON TERMINALS 4 & 5 TO BE 5W.

CONTROL SIGNAL THRESHOLD VOLTAGES TO BE MINIMUM 'ON' 20V AC/DC
MAXIMUM 'OFF'= 3V
MINIMUM CONTROL SIGNAL DURATION TO BE 300mS.

CURRENT DRAWN FROM EACH REMOTE CONTROL SIGNAL IS 5mA ON 24V DC OR 12mA ON 120V AC

WIRES ARE IDENTIFIED AT EACH END BY TERMINAL No. OR TAG No.

INDICATION CONTACTS S1-S4 ARE SHOWN IN THEIR DEFAULT CONFIGURATION. CONTACTS MAY BE CONFIGURED FOR ANY OF THE FUNCTIONS DESCRIBED IN E175E

IQT

| No | DATE | REVISION DETAILS |
|---|---|---|
| 01 | 061008 | FIRST ISSUE |

www.rotork.com

CONFIG BY TPW
DATE 061008

6000-000 B1, C1, 41, M1
CUSTOMER SPECIFIC

# Rotork Site Training Syllabus (for IQMKII)

**I. Introduction to Rotork**

A. Tech introduction
B. Rotork Controls, Inc.
C. Types and models of actuators. Sizing, classifications. Nameplates.
D. Documentation, Rotork.com
   1) IQMKII- E110, E120, E170E2, E170E3, E180, Wiring diagrams

**II. IQMKII**

A. Nomenclature and parts ID.
   1) Gearcase, center column, resolver drive, battery, terminal block/cover, seals and o-rings.
   2) Motor & wormwheel, torque transducer (piezo assembly).
   3) Handwheel (THW, SHW), Hand/Auto (H/A) lever
   4) Electronics- Cover (UV window, local controls), main pcb, power module, resolver
   5) Bases, drive bushings.
   6) Options, gearboxes, if applicable

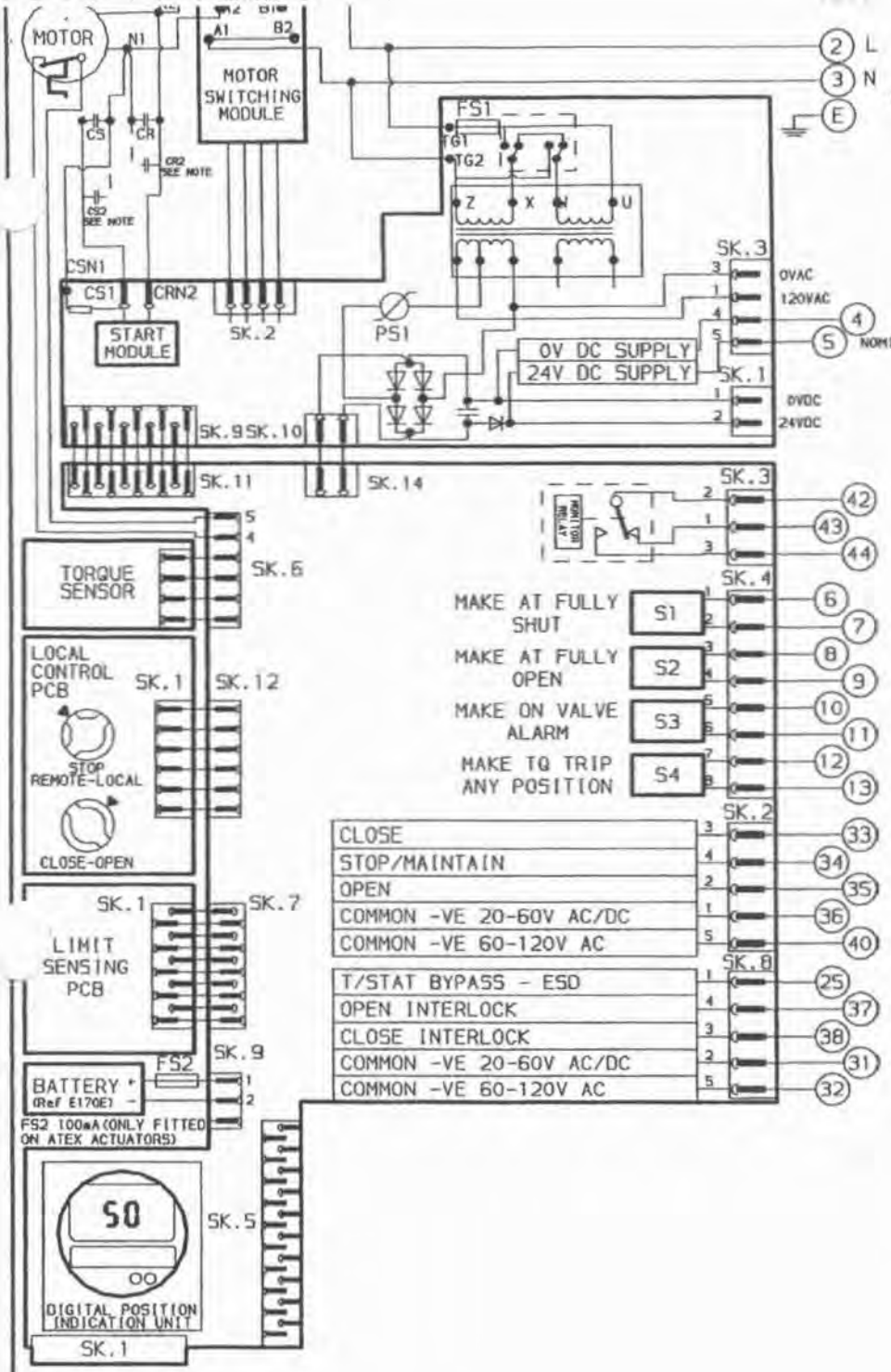
**III. Operation, set-up and calibration**

A. Manual operation
B. Setting tool and display
C. Menu structure and functions
   1) Torque display, password screen
   2) Primary functions- open/close action, torque setting, limit setting.
   3) Secondary functions-Indication, ESD(emerg shut down), options
D. Local operation
E. Remote operation
   1) Remote voltage supplies 2) Remote control configurations 3) Network options
F. Installation and adaption
G.Troubleshooting
   1) Alarms 2) Help screens 3) Common faults and checks
H. Maintenance
   1) Lubrication 2) Inspection 3) Spares

**IV. Advanced Functions and Utilities (using laptop)**

A. Insight
B. Configuration Files
C. Datalogger files
   1) Torque profiles (for baseline files/trending, torque issues)
   2) Event logging and review

**V. Conclusion- Review and Follow-up**




RWS300

TRANSFORMER TAPPING

| VOLTAGE | 60HZ |
|---|---|
| LOW | 92-135 |

FUSE FS1 - 500mA ANTI-SURGE
PS1 SELF RESETTING FUSE.

CAPACITOR START/RUN
(CS/CS2 and CR/CR2)
COMBINATIONS & VALUES VARY WITH
SUPPLY VOLTAGE & ACTUATOR SIZE.

NOTE

REFER TO PUBLICATION E170E FOR APPROVED FUSES FS1 AND FS2.

MAX EXTERNAL LOAD ON TERMINALS 4 & 5 TO BE 5W.

CONTROL SIGNAL THRESHOLD VOLTAGES
TO BE MINIMUM 'ON' 20V AC/DC
MAXIMUM 'OFF'= 3V
MINIMUM CONTROL SIGNAL DURATION
TO BE 300mS.

CURRENT DRAWN FROM EACH REMOTE CONTROL SIGNAL IS 5mA ON 24V DC OR 12mA ON 120V AC

WIRES ARE IDENTIFIED AT EACH END BY TERMINAL No. OR TAG No.

INDICATION CONTACTS S1-S4 ARE SHOWN IN THEIR DEFAULT CONFIGURATION. CONTACTS MAY BE CONFIGURED FOR ANY OF THE FUNCTIONS DESCRIBED IN E170E

1Q

| No | DATE | REVISION DETAILS |
|---|---|---|
| 01 | 061008 | FIRST ISSUE |

www.rotork.com

CONFIG BY TPW
DATE 061008

3001-000 B1, C1, 41, M1
CUSTOMER SPECIFIC

CITY OF CAMAS
616 Northeast Fourth Avenue
P.O. Box 1055
Camas, Washington 98607
http://www.ci.camas.wa.us

RECEIVED
DEPT. OF ECOLOGY/SWRO

'01 SEP -4 A10:37

August 29, 2001

DEPARTMENT OF PUBLIC WORKS

Mr. Mike Harris
Department of Ecology
300 Desmond Drive
P.O. Box 47600
Olympia, WA 98504-7600

***Subject:*** ***Water Right Application Submittals***
***City of Camas***

Dear Mr. Harris:

Enclosed you will find two water right applications along with the statutory examination fee of $10.00 for each water right application (total of $20.00). The enclosed applications are for new water supply sources in the Lacamas Basin.

The City of Camas would like to develop three new supply wells under these applications to meet the rapid growth, which is occurring in the western portion of our service area. We recently completed an extensive test well drilling program in this area. The results of the exploratory drilling and aquifer testing are summarized in the attached report titled *City of Camas, Westside Test Well Drilling Program (PGG, 2001).*

At your convenience, we would like to schedule a meeting with you and your staff to discuss the results of our test well program and strategies for obtaining water right permits for new production wells.

We appreciate your assistance on this matter.

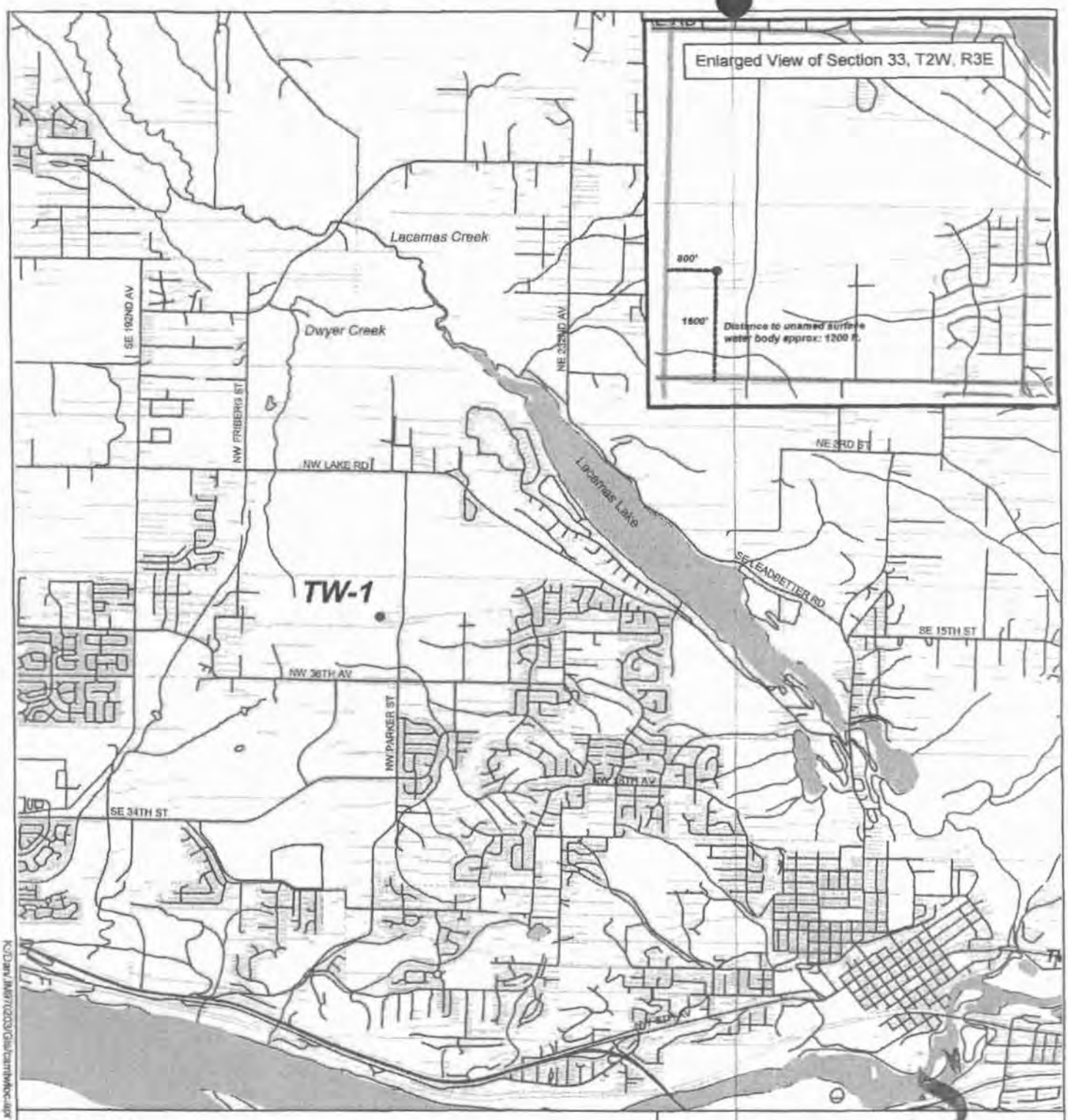
Sincerely,

Eric Levison
Engineering Manager

Enclosures: Water Right Applications

rls:g:\pworks\eric\harris.082901.doc


Enlarged View of Section 33, T2W, R3E
800'
1600'
Distance to unamed surface water body approx: 1200 ft.
Lacamas Creek
Dwyer Creek
Lacamas Lake
TW-1
SE 192ND AV
NW FRIBERG ST
NW LAKE RD
NE 252ND AV
NE 3RD ST
SE LEADBETTER RD
SE 15TH ST
NW 38TH AV
NW PARKER ST
NW 28TH AV
SE 34TH ST
NW 16TH AV
Legend
Proposed Supply Well Site
Roads
Parcels
Rivers, Streams
Water bodies
N
0
4000 Feet
Figure 1
Proposed Well Location Map
City of Camas
Westside Test Well
Drilling Program
JM9702.03
Pacific Groundwater Group
K:/Dept/JM/9702/03/Gis/camtwloc.apr (Test Well Location Map) 1/22/01




K:\Data\JM\9702\03\Gis\camwtlloc.apx (Test Well Location Map), 2/22/01

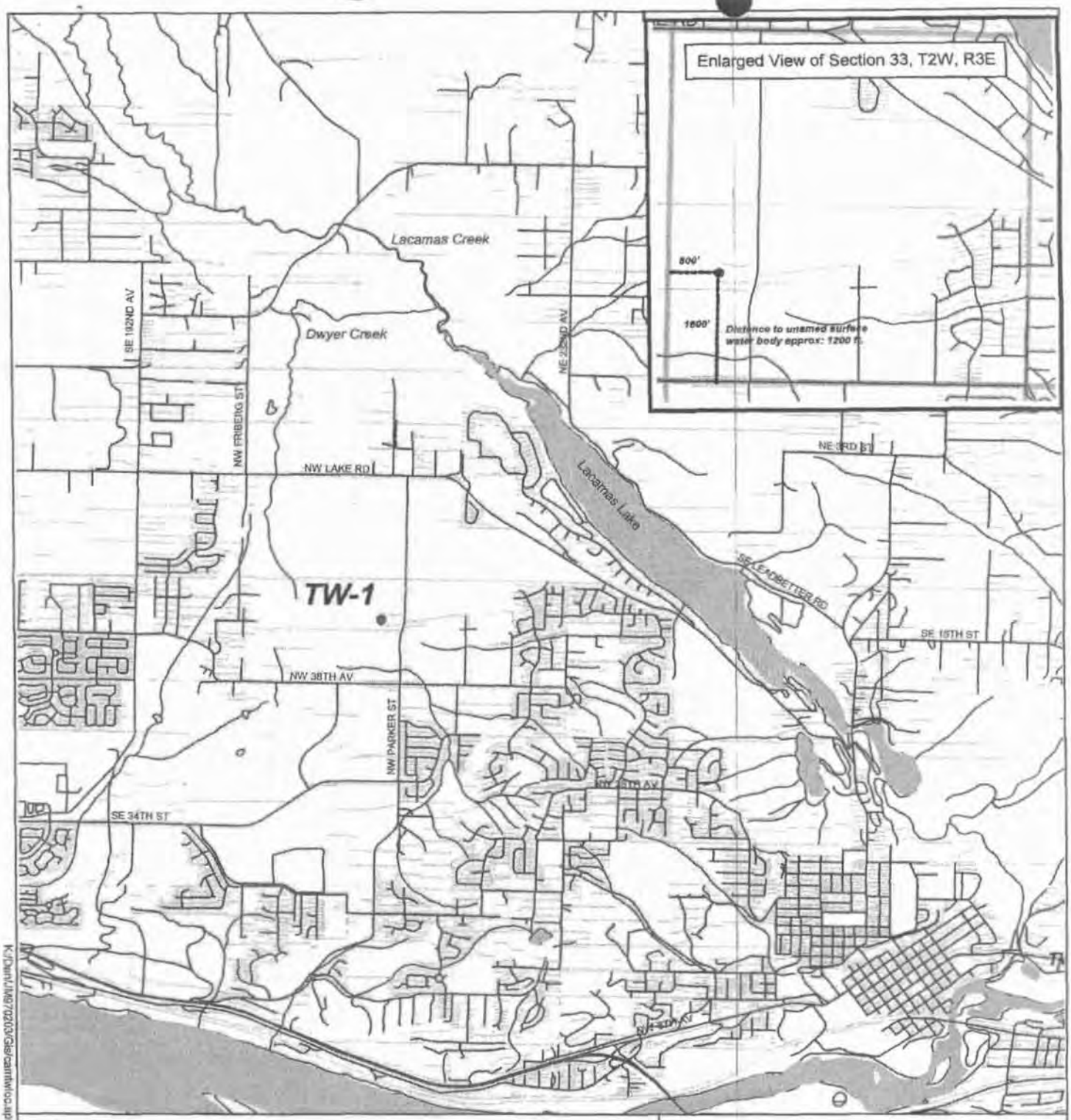



**Figure 1**
**Proposed Well Location Map**

City of Camas
Westside Test Well
Drilling Program

JM9702.03

Pacific Groundwater Group

K:\Dwn\JM9702\03\Gis\camtwloc.apr (Test Well Location Map), 2/22/01

## TABLE 1-3

## City of Camas Water Right Summary

| Source | Location of Diversions | Identification Number | Priority Date | Instantaneous Quantity $Q_i$ (gpm) | Annual Quantity $Q_a$ (ac-ft/yr.) |
|---|---|---|---|---|---|
| **Claims** | | | | | |
| Well No. 1 | 2159 ft. N, 667 ft. E, from the SW corner, S12, T1N, R3E | 121022 | 6/11/74 | 900 | 320(1) |
| Well No. 2 | 2152 ft. N, 731 ft. E, from the SW corner, S12, T1N, R3E | 121023 | 6/11/74 | 900 | 230(1) |
| **Certificates** | | | | | |
| Boulder Creek | (need this info) | S 712 C | 8/22/23 | 1120 [2.5 cfs] | 1820(2) (P) |
| Jones Creek | SE1/4, SW1/4, S3, T2N,R4E | S 711 C | 9/5/30 | 450 [1.0 cfs] | 730(3) (P) |
| Well No. 3 | NW1/4, SW1/4, S12,T1N, R3E | G 85-A C | 7/21/45 | 1200 | 118 (P) |
| Well No. 4 | W1/2, NW1/4, S12, T1N, R3E | G 4072-A C | 2/12/59 | 1325 | 1208 (S) |
| Well No. 5 | Lot 9 of Orchard Homes, 2760 ft. E, 840 ft. N from SW corner, S12, T1N, R3E | G 6636-A C | 3/22/68 | 600 | 920(4) (P) |
| Well No. 6 | 2300 ft. E, 1800 ft. N from SW corner, S12, T1N, R3E | G 6635-A C | 3/22/68 | 1500 | 2400(4) (P) |
| Well No. 7 | 1245 ft. E, 2145 ft. N from SW corner, S12, T1N, R3E | G2-00501 C | 3/22/71 | 1000 | 530(5) (P) |
| Well No. 8 | 1375 ft. E, 2145 ft. N from SW corner, S12, T1N, R 3E | G2-24400 C | 2/4/77 | 900 | 530(5) (P) |
| **Permits** | | | | | |
| Well No. 9 | 600 ft. S, 700 ft. W from N1/4 corner, S4, T1N, R3E | G4-27384 P | 8/13/86 | 650 | 210(5) (S) |
| **Total** | Sum of all existing water right certificates and permits. These values do not include claims. | | | **SW = 1570 gpm<br>GW = 7175 gpm<br>Total = 8745 gpm** | **SW = 2550 ac-ft.<br>GW = 3200 ac-ft.<br>Total = 5750 ac-ft.** |

(1) Claims must go through an adjudication procedure in state court to determine validity.
(2) This source was formerly know as the Little Washougal River. The certificate refers to an instantaneous quantity ($Q_i$) and does not specify an annual withdrawal. A DOE Report of Examination for Well No. 7 (G2-00501 C) summarizes existing water rights including 1820 ac-ft/yr. for Boulder Creek (S 712 C) based on continuous withdrawal at the instantaneous right specified.
(3) The certificate refers to an instantaneous quantity ($Q_i$) and does not specify an annual withdrawal. A DOE Report of Examination for Well No. 7 (G2-00501 C) summarizes existing water rights including 730 ac-ft/yr. for Jones Creek (S 711 C) based on continuous withdrawal at the instantaneous right specified.
(4) The Permit and Report of Examination preceding this certificate limited water rights to "the total quantity withdrawn or diverted from all sources is not to exceed 3300 ac-ft/yr."
(5) The Permit and Report of Examination preceding this certificate provided for "the total amount of water to be withdrawn or diverted, which includes the amounts as approved in Surface Water Certificates No. 711 and 712 and Ground Water Certificates No. 85,4072, 6635, 6636, shall not exceed 5750 ac-ft/yr."
(P) Primary water right, additive to other rights.
(S) Supplemental water right, not additive or considered when summing a cumulative total of all rights.

Printed By: Dawn Merryman
On: 09/07/2001 At: 10:10 am

# RECEIPT

Receipt Number **02-005123**

**Department of Ecology (4610)**
**PO Box 5128**
**Lacey, WA 98509-5128**
**(360) 407-7095**

Current Document Number **461G0355CJ** Date **09/10/2001** FM **03**

Remitter Name **CAMAS CITY** Receipt Name

Check/Draw Number **4149**
Document Amount **$20.00**
Method of Payment **Check**
Comment Description **WATER RIGHTS**

| Ref Doc Nr | Ref Doc Sfx | Inv Nr | Id Nr | Prgm Cd | T C | R | Fund | Maj Grp | Maj Src | Sub Src | Cnty | Work Cls | PIC | AI | Org | Prj | Sub Prj | Prj Phs | Sub Obj | Sub Sub Obj | Var GL | Sub Sid Dr | Sub Sid Cr | Alloc Amt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | H00 | 001 | | 001 | 02 | 85 | 000010 | | | | | | | | | | | | | | $20.00 |

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA



October 31, 2001

Department of Ecology
Southwest Regional Office
7272 Cleanwater Lane
Olympia, Washington 98504-6811

WATER RIGHT APPLICATION REVIEW

**Application Number:** G230018

**Applicant:** City of Camas
616 NE 4th Avenue
Camas, Washington 98607

**WRIA:** 28
**Water:** Well near Lacamas Lake and the Columbia River.
**This water and/or affected reaches downstream are inhabited by:**

**Based on:** ☐ Site-specific observations ☐ WDFW database or GIS
☐ Literature ☐ Knowledge of this type of stream

**Amount:** cfs 359.00 gpm 300.00 acre-ft
**Point of diversion:** NW1/4 SW1/4 of S33 T2N R3E.
**Point of use:**

**WDFW recommended conditions:**

☐ Instream flows in WAC 173-5

☐ This water right should be subject to any established lake levels, if any.

**Instream flows based on:** ☐ IFIM study ☐ USGS toe-width ☐ Tennant
☐ Other:

**WDFW requests that water right be subject to the following instream flows or natural flow, whichever is less:**

Jan
Feb
Mar
Apr
May
Jun

Jul
Aug
Sep
Oct
Nov
Dec

**Instream flows to be measured at:**

**Other conditions requested by WDFW indicated by ☐:**

☐ HPA

☐ Screen intake if accessible to fish (to be determined during application for HPA) according to WDFW standards.

☐ Based upon review of fish resources present, type and amount of water use, condition of habitat, and amount of water available, WDFW REQUESTS DENIAL of this application, in accordance with RCW 75.20.050, IF THIS SPACE IS CHECKED.

☐ WDFW recommends modification of this proposal to minimize impacts to fish.

☐ WDFW is a landowner and water user that will be affected by this proposed use.

☐ Please HOLD this application pending field review. WDFW staff will provide detailed response by

☐ Granting this water right application would adversely affect WDFW's existing water rights for a facility. We request the following conditions for this water right if it is granted.

**Rationale for WDFW recommendations if not based on existing rules or statutes:** WDFW has no objections to this application.

**Additional Comments:**

Karen Kloempken

Karen Kloempken
Water Rights Biologist
360-902-2615
Fax: 360-902-2946
E-mail: kloemkak@dfw.wa.gov

# State of Washington
# Application for a Water Right

Please follow the attached instructions to avoid unnecessary delays.

For Ecology Use
Fee Paid _____
Date _____

## Section 1. APPLICANT - PERSON, ORGANIZATION, OR WATER SYSTEM

Name City of Camas Home Tel:( ) -
Mailing Address 616 NE 4th Ave. Work Tel:(360 ) 834 - 3451
City Camas State WA Zip+4 98607 + FAX:( 360 ) 834 - 1535

## Section 2. CONTACT - PERSON TO CALL ABOUT THE APPLICATION

☐ Same as above

Name Eric Levison Home Tel:( ) -
Mailing Address 616 NE 4th Ave. Work Tel:(360 ) 834 - 3451
City Camas State WA Zip+4 98607 + FAX:( 360 ) 834 - 1535
Relationship to applicant Engineering Manager - City of Camas

## Section 3. STATEMENT OF INTENT

Municipal

The applicant requests a permit to use not more than 350 ( ☒ gallons per minute or ☐ cubic feet per second) from a ☐ surface water source or ☒ ground water source (check only one) for the purpose(s) of Domestic/Public Supply. **ATTACH A "LEGAL" DESCRIPTION OF THE PLACE OF USE.** (See instructions.) *NOTE: A tax parcel number or a plat number is not sufficient.* Area served by City of Camas
Estimate a maximum annual quantity to be used in acre-feet per year: 300 AF/YR

☐ Check if the water use is proposed for a short-term project. Indicate the period of time that the water will be needed:
From ___/___/___ to ___/___/___

## Section 4. WATER SOURCE

| If SURFACE WATER | If GROUNDWATER |
|---|---|
| Name the water source and indicate if stream, spring, lake, etc. If unnamed, write "unnamed spring," "unnamed stream," etc.:<br><br>Number of diversions: | A permit is desired for 1 well(s). |
| Source flows into (name of body of water): | Size & depth of well(s): 12-inch well<br>400 feet deep |

**LOCATION**

Enter the north-south and east-west distances in feet from the point of diversion or withdrawal to the nearest section corner: 1600 feet north and 800 feet east of the SW 1/4 of Section 33, Township 2 North, Range 3 East

| ¼ of | ¼ of | Section | Township | Range(E/W) | County | If location of source is platted, complete below: Lot | Block | Subdivision |
|---|---|---|---|---|---|---|---|---|
| NW | SW | 33 | 2N | 3E | Clark | | | |
| | | | | | | | | |

For Ecology Use Date Received: 9-4-01 Priority Date: 9-4-01
SEPA: Exempt/Not Exempt FERC License # Dept. Of Health #
Date Accepted As Complete 9-21-01 By SC Date Returned By WRIA 28

ECY 040-1-14
Rev. 9/95 F

**APPLICATION**

Appl. No.: G2-30018

29-30018

## Section 5. GENERAL WATER SYSTEM INFORMATION

A. Name of system, if named: Camas Municipal Water-Sewer System

B. Briefly describe your proposed water system. (See instructions.)

One 12-inch supply well will be constructed to a depth of 400 feet. The well will be used to provide water supply to municipal and industrial water users that are served by the City of Camas in the Lacamas Basin Area. See City's 1996 Water System Plan documents for other related water system information.

C. Do you already have any water rights or claims associated with this property or system? ☒ YES ☐ NO
PROVIDE DOCUMENTATION. See list of city water right permits and claims that are attached.

## Section 6. DOMESTIC / PUBLIC WATER SUPPLY SYSTEM INFORMATION
*(Completed for all domestic/public supply uses.)*

A. Number of "connections" requested: 4896 Type of connection Municipal Industrial Hookup
(Homes, Apartment, Recreational, etc.)

B. Are you within the area of an approved water system? ☒ YES ☐ NO
If yes, explain why you are unable to connect to the system. *Note: Regional water systems are identified by your County Health Department.* The applicant (City of Camas) is the regional water provider.

**Complete C. and D. only if the proposed water system will have fifteen or more connections.**

C. Do you have a current water system plan approved by the Washington State Department of Health? ☒ YES ☐ NO
If yes, when was it approved? 1996 Please attach the current approved version of your plan.
Note: City is currently updating their Waster System Plan. The new plan should be approved in early 2002.

D. Do you have an approved conservation plan? ☒ YES ☐ NO
If yes, when was it approved? 1996 Please attach the current approved version of your plan.
Note: Water Conservation Plan incorporated into 1996 Water System Plan which is currently being updated.

## Section 7. IRRIGATION/AGRICULTURAL/FARM INFORMATION
*(Complete for all irrigation and agriculture uses.)* N/A

A. Total number of acres to be irrigated: _____

B. List total number of acres for other specified agricultural uses:

Use _____ Acres _____
Use _____ Acres _____
Use _____ Acres _____

C. Total number of acres to be covered by this application: _____

D. Family Farm Act (Initiative Measure Number 59, November 3, 1977)
Add up the acreage in which you have a controlling interest, including only:
‡ Acreage irrigated under water rights acquired after December 8, 1977;
‡ Acreage proposed to be irrigated under this application;
‡ Acreage proposed to be irrigated under other pending application(s).

1. Is the combined acreage greater than 2000 acres? ☐ YES ☐ NO
2. Do you have a controlling interest in a Family Farm Development Permit? ☐ YES ☐ NO
If yes, enter permit no: _____

E. Farm uses:
Stockwater - Total # of animals _____ Animal type _____ (If dairy cattle, see below)
Dairy - # Milking _____ # Non-milking _____

## Section 8. WATER STORAGE

Will you be using a dam, dike, or other structure to retain or store water? ☐ YES ☒ NO

*NOTE: If you will be storing 10 acre-feet or more of water and/or if the water depth will be 10 feet or more at the deepest point, and some portion of the storage will be above grade, you must also apply for a reservoir permit. You can get a reservoir permit application from the Department of Ecology.*

## Section 9. DRIVING DIRECTIONS

Provide detailed driving instructions to the project site. From Lacey, WA, go southbound on I-5. Take I-205 exit at Hazel Dell. Proceed southbound on I-205 to SR-14. Take SR-14 eastbound to Brady Road. Proceed northbound on Brady Road, which turns into NW Parker Avenue, continue northbound on NW Parker Avenue past 20th Street NW. Turn into Fire Station Property, which is located on west side of NW Parker Avenue.

## Section 10. REQUIRED MAP

A. Attach a map of the project. (See instructions.)

## Section 11. PROPERTY OWNERSHIP

A. Does the applicant own the land on which the water will be used? ☐ YES ☒ NO
If no, explain the applicant's interest in the place of use and provide the name(s) and address(es) of the owner(s):

The City will use the water for supply within their service area.

B. Does the applicant own the land on which the water source is located? ☐ YES ☐ NO
If no, submit a copy of agreement:

The City will purchase the property as part of the supply well development.

**I certify that the information above is true and accurate to the best of my knowledge. I understand that in order to process my application, I grant staff from the Department of Ecology access to the site for inspection and monitoring purposes. Even though I may have been assisted in the preparation of the above application by the employees of the Department of Ecology, all responsibility for the accuracy of the information rests with me.**

City of Camas E. Levison Eric Levison — 8/29/01

Applicant (or authorized representative) — Date

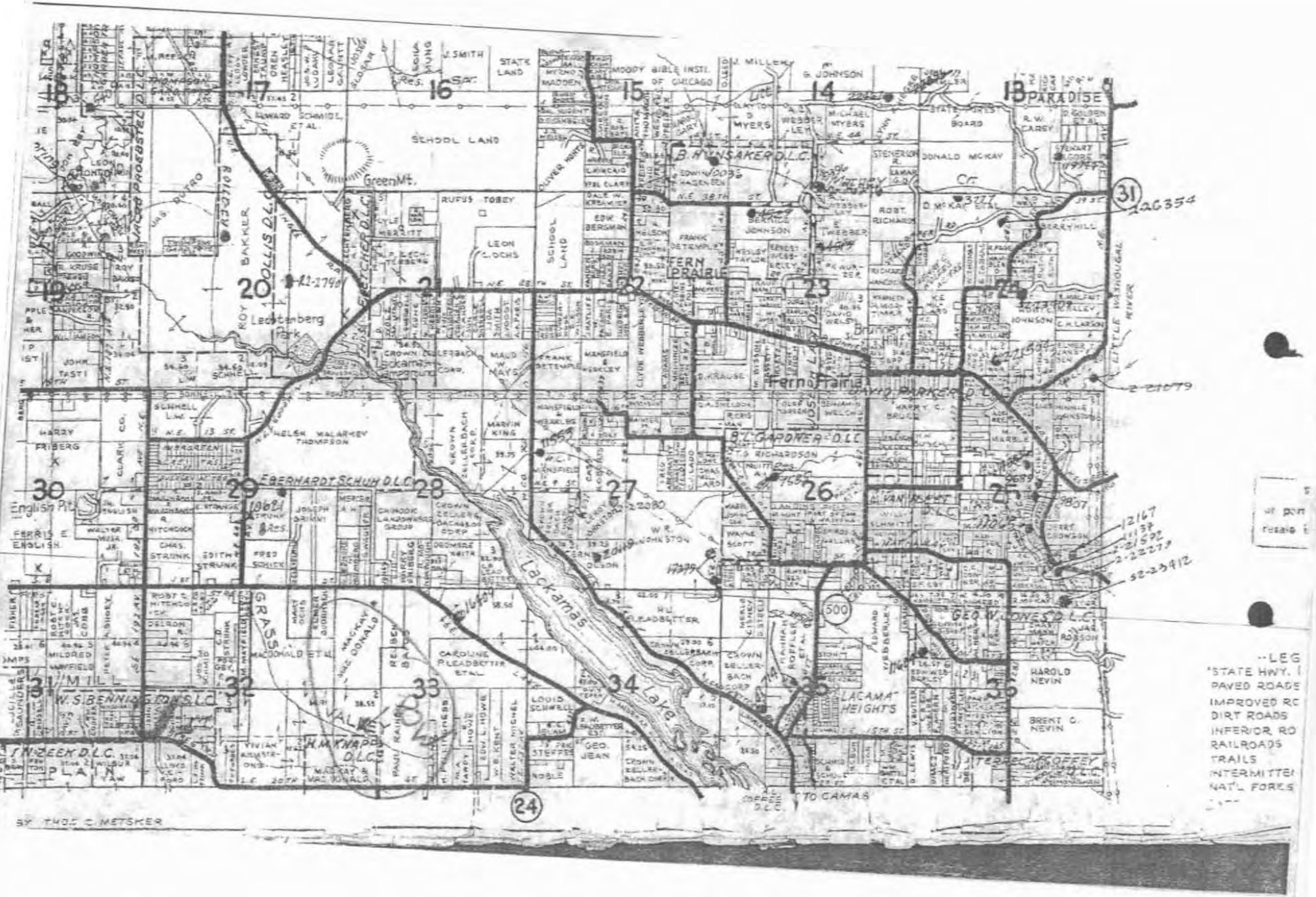
Landowner for place of use (if same as applicant, write "same") — Date

**Use this page to continue your answers to any questions on the application. Please indicate section number before answer.**

| We are returning your application for the following reason(s): | |
|---|---|
| _____ Examination fee was not enclosed | APPLICANT PLEASE RETURN TO CASHIER, PO BOX 5128, LACEY, WA 98509-5128 |
| _____ Section number(s) _____ is/are incomplete | APPLICANT PLEASE RETURN TO THE APPROPRIATE REGIONAL OFFICE |
| Explanation: | |
| *Please provide the additional information requested above and return your application by* _____ _____ *(date).* | |

Ecology staff_____ Date_____

To receive this document in alternative format, contact Lisa Newman at (360) 407-6604 (Voice) or (360) 407-6006 (TDD).


SCHOOL LAND
GreenMt.
FERN PRAIRIE
Fern Prairie
Lackamas
Lake
LACAMA HEIGHTS
MILL
PARADISE
TO CAMAS
LEGEND
STATE HWY.
PAVED ROADS
IMPROVED RD
DIRT ROADS
INFERIOR RD
RAILROADS
TRAILS
INTERMITTE
NAT'L FORES

616 NE 4th Avenue
PO Box 1055
Camas WA 98607

WASHINGTON STATE DEPARTMENT OF ECOLOGY

# STATE OF WASHINGTON
## *CERTIFICATE OF CHANGE ON A CLAIM*

**Document Title:** Certificate of Water Right

**Agency:** Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

**Applicant:** **City of Camas**
**616 NE 4th Ave**
**PO Box 1055**
**Camas, WA 98607**

**Reference Number:**

| PRIORITY DATE | CLAIM NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| 3/09/2001 | G2-121022 | | G2-CV1-2P159 |

*This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.*

### PUBLIC WATERS TO BE APPROPRIATED

| SOURCE | TRIBUTARY OF (IF SURFACE WATERS) |
|---|---|
| Well 12 | |

| MAX. CUBIC FEET PER SECOND | MAX GALLONS PER MINUTE | MAX. ACRE-FEET PER YEAR |
|---|---|---|
| | 900 GPM | 320 AF/Y |

QUANTITY/TYPE OF USE/PERIOD OF USE

320 Acre-feet per year  Municipal Supply  Year-round, as needed

### LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF WITHDRAWAL

2240 feet North and 1000 feet East of the Southwest corner of Section 12.

| ¼ ¼ | SECTION | TOWNSHIP N. | RANGE (E. OR W.) W.M. | W.R.I.A. | COUNTY |
|---|---|---|---|---|---|
| NW ¼ SW ¼ | 12 | 1 | 3E | 28 | Clark |

PARCEL # 89892000

### LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

| 1/4 1/4 | SECTION | TOWNSHIP N. | RANGE (E. OR W.) W.M. | W.R I.A. | COUNTY |
|---|---|---|---|---|---|
| N/A | N/A | N/A | N/A | 28 | Clark |

PARCEL #

**Area served by City of Camas for municipal supply.**

N/A

## CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

N/A

## PROVISIONS

All conditions and requirements contained in reports of examination or permits previously issued apply to this certificate unless specifically noted below.

The water appropriated under this application will be used for public water supply. The State Board of Health rules require public water supply owners to obtain written approval from the Office of Water Supply, Department of Health, 1112 SE Quince Street, PO Box 47890, Olympia, Washington 98504-7890, prior to any new construction or alterations of a public water supply system.

An approved measuring device shall be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

Water use data shall be recorded monthly. The maximum rate of diversion/withdrawal and the annual total volume shall be submitted to Ecology by January 31st of each calendar year.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit/Certificate/Claim No., source name, annual quantity used including units, maximum rate of diversion including units, monthly meter readings including units, peak monthly flow including units, Department of Health WFI water system number and source number(s), well tag number, and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information. Submit data to: Department of Ecology, SWRO/WR PO Box 47775, Olympia, WA 98504-7775.

Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable

(continued on page 3)

**The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.100.**

**This certificate of water right is specifically subject to relinquishment for non-use of water as provided in Chapter 90.14 RCW.**

*Given under my hand and the seal of this office at Olympia, Washington, this* 5th *day of* February, *2008.*

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

Jay Manning, Director
Department of Ecology

By Thomas Loranger
Thomas Loranger Section Manager

OK

Provisions Continued

times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

All wells constructed in the State shall meet the construction requirements of Chapter 173-160 WAC entitled "Minimum Standards for the Construction and Maintenance of Wells" and Chapter 18-104 RCW entitled "Water Well Construction, Act (1971)."

In accordance with Chapter 173-160 WAC, wells shall not be located within certain minimum distances of potential sources of contamination. These minimum distances shall comply with local health regulations, as appropriate. In general, wells shall be located at least 100 feet from sources of contamination. Wells shall not be located within 1,000 feet of a solid waste landfill.

Nothing in this approval shall be construed as lessening or enlarging any water rights represented by Water Right Claim No's 121022 & 121023. The water use authorized under this filing (fill in with water right no.) shall be considered supplemental to any water rights confirmed for said claim as a result of a general adjudication through Superior Court, should adjudication be undertaken.

PO Box 1055
Camas WA 98607

# STATE OF WASHINGTON
## *CERTIFICATE OF CHANGE ON A CLAIM*

**Document Title:** Certificate of Water Right

**Agency:** Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

**Applicant:** **City of Camas**
**616 NE 4th Ave**
**PO Box 1055**
**Camas, WA 98607**

**Reference Number:**

| PRIORITY DATE | CLAIM NUMBER | PERMIT NUMBER | CERTIFICATE NUMBER |
|---|---|---|---|
| 4/06/2001 | G2-121023 | | G2-CV1-2P160 |

*This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.*

## PUBLIC WATERS TO BE APPROPRIATED

| SOURCE | TRIBUTARY OF (IF SURFACE WATERS) |
|---|---|
| Well 10 | |

| MAX. CUBIC FEET PER SECOND | MAX. GALLONS PER MINUTE | MAX. ACRE-FEET PER YEAR |
|---|---|---|
| | 900 | 230 |

QUANTITY/TYPE OF USE/PERIOD OF USE

230 Acre-feet per year  Municipal Supply  Seasonal Use, May 1 – August 31

## LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF WITHDRAWAL

2220 feet North and 710 feet East of the Southwest corner of Section 12.

| ¼ ¼ | SECTION | TOWNSHIP N. | RANGE (E. OR W.) W.M. | W.R I.A. | COUNTY |
|---|---|---|---|---|---|
| NW ¼ SW ¼ | 12 | 1 | 3E | 28 | Clark |

PARCEL # 89866000

## LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

| 1/4 1/4 | SECTION | TOWNSHIP N. | RANGE (E. OR W.) W.M. | W.R I.A. | COUNTY |
|---|---|---|---|---|---|
| N/A | N/A | N/A | N/A | 28 | Clark |

PARCEL #

**Area served by City of Camas for municipal supply.**

N/A

## CONTINUED LEGAL DESCRIPTION FOR PROPERTY ON WHICH WATER IS TO BE USED

N/A

## PROVISIONS

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The water appropriated under this application will be used for public water supply. The State Board of Health rules require public water supply owners to obtain written approval from the Office of Water Supply, Department of Health, 1112 SE Quince Street, PO Box 47890, Olympia, Washington 98504-7890, *prior to any new construction* or alterations of a public water supply system.

An approved measuring device shall be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", Chapter 173-173 WAC.

Water use data shall be recorded *monthly*. The *maximum rate of diversion/withdrawal* and the annual total volume shall be submitted to Ecology by January 31st of each calendar year.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit/Certificate/Claim No., source name, annual quantity used including units, maximum rate of diversion including units, monthly meter readings including units, peak monthly flow including units, Department of Health WFI water system number and source number(s), well tag number, and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information. Submit data to: Department of Ecology, SWRO/WR PO Box 47775, Olympia, WA 98504-7775.

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*Given under my hand and the seal of this office at Olympia, Washington, this* 5th *day of* February, *2008.*

Jay Manning, Director
Department of Ecology

By Thomas Loranger
Thomas Loranger, Section Manager

OK

Provisions Continued

times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

All wells constructed in the State shall meet the construction requirements of Chapter 173-160 WAC entitled "Minimum Standards for the Construction and Maintenance of Wells" and Chapter 18-104 RCW entitled "Water Well Construction, Act (1971)."

In accordance with Chapter 173-160 WAC, wells shall not be located within certain minimum distances of potential sources of contamination. These minimum distances shall comply with local health regulations, as appropriate. In general, wells shall be located at least 100 feet from sources of contamination. Wells shall not be located within 1,000 feet of a solid waste landfill.

Nothing in this approval shall be construed as lessening or enlarging any water rights represented by Water Right Claim No's 121022 & 121023. The water use authorized under this filing (fill in with water right no.) shall be considered supplemental to any water rights confirmed for said claim as a result of a general adjudication through Superior Court, should adjudication be undertaken.

## Hall, Tammy (ECY)

**From:** Hall, Tammy (ECY)
**Sent:** Monday, October 08, 2018 11:09 AM
**To:** Bennett, Rose (ECY)
**Cc:** 'Jill Van Hulle'; 'sadams@cityofcamas.us'
**Subject:** New Streamlined CRA-City of Camas G2-30019

Good morning Rose

This application requests 1,000 gpm for municipal supply.

Would you please put me down for 25 hours of review time.

| | Project Manager/ Primary Point of Contact | Billing Contact |
|---|---|---|
| Name | Sam Adams, Utilities Manager | Same |
| Address | 1620 SE 8th Ave<br>Camas, WA 98607 | |
| Telephone | 360-817-7003 | |
| Fax | | |
| Email | sadams@cityofcamas.us | |

TAMMY HALL, L.HG.--HYDROGEOLOGIST
WA DEPT OF ECOLOGY--WATER RESOURCES PROGRAM--SOUTHWEST REGIONAL OFFICE
PO BOX 47775 | OLYMPIA, WA 98504-7775
v 360-407-6099 | f 407-6305 | tammy.hall@ecy.wa.gov

City of Camas
WASHINGTON

Public Works Department



September 19, 2018

Tammy Hall
Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775

RE: Streamlined CRA Request for City of Camas Well 17 (G2-30019)

Dear Ms. Hall:

The City of Camas would like to move forward with the processing of our *Application for Water Right G2-30019.* This request is associated with our Well 17 which is currently being drilled under the Preliminary Permit you issued. As you are already aware the issuance of new water rights in the Lacamas Creek watershed is regulated protect flows. Our current water right permitting approach is to provide Ecology with an appropriate mitigation offset for the water we will be withdrawing from Well 17.

**We wish to use the Streamlined Cost Reimbursement Process, and enter into a contract with Ecology to oversee the processing of our new application.**

Our consultant Pacific Groundwater Group's (PGG) preliminary evaluation of Well 17 indicates that a relatively small portion (less than 10%) of our projected surface water capture from the well will affect stream flows in the Lacamas Creek drainage above the confluence with the Lacamas Lake impoundment and the balance of the capture is to the impoundment itself. We understand that mitigation for this site, as for all new applications in WRIA 28, needs to be provided in a manner consistent with the recommendation of the WRIA 27/28 Planning Group, and embodied in the provisions of WAC 173-528.

Under the Streamlined CRA approach PGG will prepare a Report of Examination (ROE) for your review. The ROE will address impairment, mitigations and consistency with WAC 173-528.

For contracting purposes please use the following information:

| | **Project Manager/ Primary Point of Contact** | **Billing Contact** |
|---|---|---|
| Name | Sam Adams, Utilities Manager | Sam Adams |
| Address | 1620 SE 8th Avenue, Camas, WA 98607 | Same |
| Telephone | (360) 817-7003 | |
| Email | sadams@cityofcamas.us | |

Feel free to contact me at (360) 817-7003, or you may speak directly with Jill Van Hulle at (360) 413-1510.

Sincerely,

Sam Adams
Utilities Manager
City of Camas

UNITED STATES POSTAL SERVICE

Date: April 6, 2018

Teresa Hanson:

The following is in response to your April 6, 2018 request for delivery information on your Certified Mail™ item number 9171999991703776661108. The delivery record shows that this item was delivered on April 2, 2018 at 11:22 am in CAMAS, WA 98607. The scanned image of the recipient information is provided below.

Signature of Recipient :

Address of Recipient : 616 NE 4th

Thank you for selecting the Postal Service for your mailing needs.

If you require additional assistance, please contact your local Post Office or postal representative.

Sincerely,
United States Postal Service

Re. G2-30019

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
*PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300*

March 29, 2018

City of Camas
Attn: Eric Levison
616 NE 4th Ave
Camas WA 98607

Re: Preliminary Permit to Drill and Test a Well for Water Right Application G2-30019

Dear Mr. Levison:

Water Right Application G2-30019 requests 1,000 gallons per minute (gpm) and 1,200 acre-feet (ac-ft) per year for municipal supply. The proposed point of withdrawal is a well to be drilled in the SW ¼ NW ¼ of Section 34, T. 2 N., R. 3 E.W.M. of Clark County.

Under the authority of RCW 90.03.290, Ecology can issue a Preliminary Permit for a water right applicant to conduct studies, surveys, and investigations to gather information to assess a water right application. This Preliminary Permit allows temporary groundwater withdrawals for testing purposes only.

Ecology needs information that evaluates your proposed withdrawal before your application can be processed. Impacts to area users and surface water impacts need to be evaluated. Ecology reserves the right to ask for more information before making a final decision on the application, if necessary.

The requirements of this Preliminary Permit must be met within the deadline or Water Right Application G2-30019 will automatically be cancelled. This Preliminary Permit does not commit Ecology to approve the water right for your project. Other uses needing a water right permit are not allowed unless approved.

Ecology has determined the activities authorized under this Preliminary Permit are categorically exempt from SEPA review under WAC 197-11-800(17).

**Please make sure that your consultant receives a copy of this Preliminary Permit to ensure compliance with all requirements. If adverse impacts to senior water right holders occur during any portion of the test, the test must be stopped immediately. Once testing is complete, the well must be capped so it does not pose a safety hazard.**

This Preliminary Permit will remain in effect until April 1, 2020, unless revoked sooner by Ecology. The City of Camas will assume all expenses, risks, and liabilities incurred in response to this Preliminary Permit.

**This Preliminary Permit is subject to existing rights and the following requirements:**

**Requirements for drilling new wells:**

- ✓ All water wells constructed must meet the minimum standards for construction and maintenance. Chapter 18.104 RCW (Washington Water Well Construction Act of 1971) and Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Water Wells) discuss well construction requirements.

| |
|---|
| *Check with the County Health Department to see if well site approval is required before well construction.* |

- ✓ Wells must be at least 100 feet away from potential sources of contamination, such as a sewer, septic tank, privy as specified in WAC 173-160-171. Wells must also be at least 1,000 feet away from solid waste landfills. These minimum distances must also comply with state and local health laws.

- ✓ The well must have a well-maintained access port. A backflow check-valve must also be installed. This valve will prevent water from flowing back into the well when pumping stops so data collected during recovery is accurate.

- ✓ The well driller must submit a well report for the new wells to Ecology within 30 days after drilling.

**Requirements for test observation wells:**

- ✓ At least one observation well must be monitored for drawdown, recovery and water quality during the aquifer test.

- ✓ Observation wells must be completed in the same aquifer as the pumping well and not be actively pumping during the test.

- ✓ Wells should be selected where they will best determine potential for impacts to surface water in the area, effects on nearby wells, and potential to cause seawater intrusion.

**Requirements for pumping test:**

*The Washington State Department of Health (DOH) Water System Design Manual (DOH #331-123, June 99), Appendix E provides guidelines for designing and conducting aquifer tests (available at www.doh.wa.gov/ehp/dw). DOH guidelines are minimum requirements. Failure to follow correct methods may require the tests to be repeated.*

- ✓ A Washington Licensed Hydrogeologist or Registered Engineer, specializing in groundwater evaluation, must supervise the test and perform data analysis.
- ✓ The well must be tested at a constant rate not less than the maximum design rate of the well.
- ✓ The test **must be designed to provide the following information:**
  - Distance and time drawdown response in the producing aquifer.
  - Aquifer transmissivity.
  - Aquifer storage coefficient and specific yield.
  - Effects on regulated surface water.
  - Effects to area users

*Select accurate water level devices, such as transducers, or electric tape, to measure water levels. All watches and clocks used for timing should be synchronized so that each measurement can be referenced to the exact time since pumping began.*

- ✓ The pumping portion of the test must be at least 24 hours long OR until the water level in the pumping well has been stable for at least four (4) hours, whichever occurs last.

*Water levels are stable if they drop less than 0.1 foot in an hour while the well is pumping. Measuring points for water levels must be accurately located within 10 feet horizontally and 1 foot vertically.*

- ✓ Water pumped during the test should be discharged so it will not recharge the drawdown cone or influence monitoring during the test.

- ✓ Recovery data must be collected from all wells until the water level in the pumped well nears pre-pumping conditions and the water-level recovery rate is less than 0.1 foot per hour.

- ✓ Data collected must be corrected for influences of barometric pressure, if applicable.

> *Ecology recommends measuring water levels in the test and observation well every hour at least 48 hours before the start of the aquifer test. This will help evaluate aquifer response to external stresses such as precipitation and well interference. Barometric pressure should also be monitored on similar schedule, particularly for confined aquifers, so corrections for barometric influences can be made.*

For water quality sampling, water samples must be collected from the pumping well and observation wells and tested for chlorides and conductivity at a laboratory accredited by the Department of Ecology. Water samples must be collected as follows:

- ✓ From the pumping well:
  - During the first 30 minutes of pumping.
  - About mid-way through pumping.
  - During the last 15 minutes of pumping.

- ✓ From the observation wells:
  - Before the pump test starts.
  - Immediately after all recovery data is collected and the well has recovered to its static water level.

Please be aware that the state or county health department may require additional testing prior to the approval of your project. If your project involves a public water system, please check with the appropriate health agency to determine what additional testing is required before you conduct the test.

**Requirements for reporting:**

City of Camas must file a report with Ecology when aquifer testing is complete. This information must provide Ecology with the information needed to evaluate results of the study. Ecology may request any of this information in an electronic format.

The report should contain the following information:

- ✓ Maps showing locations of wells used in pump test (pumping and observation wells) and surface water bodies.

- ✓ Pumping well information.
  - o Construction diagrams.
  - o Well report
  - o Lithology description of units.
  - o Pump intake depth.
  - o Wellhead elevation and way measured.
  - o Identification of measuring point.

- ✓ Monitoring well information.
  - o Well reports (if available).
  - o Well information and way it was determined (if no well report).
  - o Wellhead elevations and way measured.
  - o Total well depth and way determined.
  - o Screened interval and way determined.
  - o Identification of measuring point.

> *All water level and water quality data must be presented in both tabular form and on data plots.*

- ✓ Distances between pumping well and observation well(s).

- ✓ Testing information.
  - o Pumping rates.
  - o Duration of pumping and recovery.
  - o Water level information.
  - o Raw data and corrected measurements.
  - o Corrections made for tidal influences (if any).
  - o Discussion of the methods and calculations used to determine aquifer characteristics.
  - o Copies of the all field data sheets related to the testing.

- ✓ Hydrogeology information.
  - o Hydrogeologic cross-sections.
  - o Description of the hydrogeologic system.
  - o Copies of all laboratory data sheets.

## YOUR RIGHT TO APPEAL

You have a right to appeal this Preliminary Permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Preliminary Permit. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this Preliminary Permit:

- File your appeal and a copy of this with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Preliminary Permit on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

## ADDRESS AND LOCATION INFORMATION

| Street Addresses | Mailing Addresses |
|---|---|
| **Department of Ecology**<br>Attn: Appeals Processing Desk<br>300 Desmond Drive SE<br>Lacey, WA 98503<br><br>**Pollution Control Hearings Board**<br>1111 Israel RD SW<br>STE 301<br>Tumwater, WA 98501 | **Department of Ecology**<br>Attn: Appeals Processing Desk<br>PO Box 47608<br>Olympia, WA 98504-7608<br><br>**Pollution Control Hearings Board**<br>PO Box 40903<br>Olympia, WA 98504-0903 |

Michael Gallagher, Section Manger
Department of Ecology, SWRO
PO Box 47775
Lacey, WA 98504-7775

If you have any questions regarding this Preliminary Permit please contact Tammy Hall at (360) 407-6099.

Sincerely,

Joseph J. Witczak

Michael J. Gallagher, Section Manager
SWRO Water Resources Program

cc: Jill Van Hulle, Pacific Groundwater Group

By Certified Mail: 91 7199 9991 7037 7666 1108

## Hall, Tammy (ECY)

**From:** Jill Van Hulle <jill@PGWG.COM>
**Sent:** Wednesday, March 21, 2018 2:57 PM
**To:** Hall, Tammy (ECY)
**Cc:** Dan Matlock; Sam Adams (SAdams@cityofcamas.us); Carroll, Sheri (ECY)
**Subject:** City of Camas - Request for Preliminary Permit and to Amend Application G2-30019
**Attachments:** Amend Camas Application.pdf; G2-30019_Camas application.pdf; Fig1_Site_Plan_V2.pdf

Hi Tammy, it's been a couple of months since we met with your regarding the City of Camas' plans to construct a new well (Well 17) near Lacamas Lake. As we discussed the City has a new well site in mind - just over a mile south and east from the originally designated site. We would like to modify the application that was filed in 2001 (G2-30019) with the new site AND request a **Preliminary Permit to Drill and Test** as soon as possible.

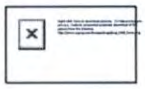
It does not appear that the original application was ever published so I will let the City know to be expecting that – and if you guys could loop me on that notice, I'd appreciate it.

A hard copy of this will be in the mail as well.

Thanks, and let me know if you need anything!

Jill

**Jill Van Hulle** | Water Resource Specialist
**Pacific Groundwater Group** | Water Resource & Environmental Consulting
(360) 413-1510 | jill@pgwg.com | www.pgwg.com



PACIFIC groundwater GROUP

RECEIVED
MAR 28 2018
WA State Department
of Ecology (SWRO)

March 21, 2018

Tammy Hall
Dept. of Ecology SWRO
PO Box 47775
Olympia, WA 98504

Re: Amendment of Application G2-30019

**Dear Tammy**

The intent of this letter is to request a modification in the *Point of Withdrawal* for pending application G2-30019 AND to request the issuance of a **Preliminary Permit** to drill and test at the new site.

Application G2-30019 was filed on September 4, 2001 in the amount of 1,000 gpm and projected annual quantity of 1,200 acre-feet per year. The intent was to construct up to two 12-inch production wells at a site immediately north of Lacamas Lake in the NE ¼ NW ¼ of Section 28, T. 2N. R. 3 E.W.M.

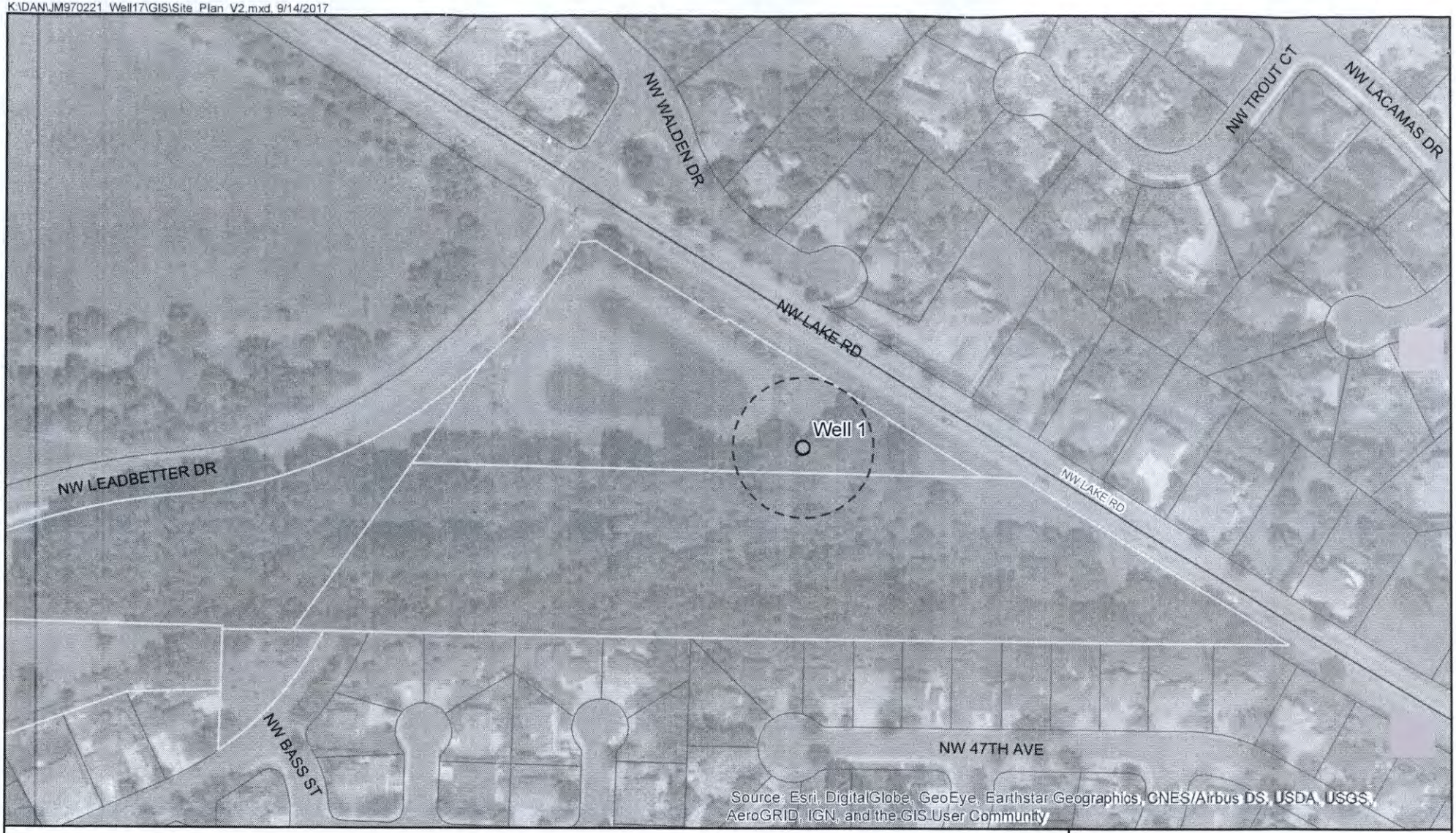
Since the time the application was filed we have reassessed our infrastructure needs and selected a new site for this well (Well 17) approximately a mile to the southeast of the original site within the SW ¼ NW ¼ of Section 34, T. 2 N., R. 3 E.W.M.

We would like to publish and secure the Preliminary Permit as soon as possible.

Sincerely,
**Pacific Groundwater Group**

Jill Van Hulle
Water Resources Specialist

K:\DAN\JM970221_Well17\GIS\Site_Plan_V2.mxd, 9/14/2017




Proposed Well 17 Location

100-ft Sanitary Control Area

City Properties

N

0 Feet 200

# Figure 1
# Camas
# Well 17 Site

PgG

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 1, 2001

City of Camas
Attn Eric Levison
616 NE 4th Avenue
Camas WA 98607

Re: Water Right Application No. G2-30019

This letter is to acknowledge that the Washington State Department of Ecology received your water right application. We have assigned your application the number indicated above. Please include this number in future correspondence regarding your application with the Department of Ecology.

When we begin actively evaluating applications in your area, we will prepare a public notice and send it to you with publication instructions. It will be sometime before we are able to begin working in your area. In the meantime, please notify Ecology of changes such as address, property ownership, or variations in your proposed water use plans.

The availability of water in Washington state is a serious problem. Much of the water in our state has already been appropriated. The competition for water has escalated with our state's increasing population, conflicting water policy issues, and grave declines in salmon and other fish populations. A new watershed management law brings us a step closer to addressing some of these issues. It sets into motion a locally based process to address water quantity, quality, and habitat issues. Watershed management will help meet challenges for getting water to people, industries, farms, and fish.

In some areas of the state, we are continuing to evaluate applications within watersheds where we have previously gathered information and completed watershed assessments. We are also continuing to process water right permit or change applications that are intended to address public health and safety emergencies, the natural environment, or are for nonconsumptive withdrawals. All other applications are grouped by watershed and processed according to the date of submittal, and when we have enough information and staff resources to make decisions.

If you would like further information on your application, please contact the Southwest Regional Office at (360) 407-0240.

Sincerely,

*J. Mike Harris*

J. Mike Harris
Water Resources Supervisor
Southwest Regional Office

JMH:th (applet.doc)

# APPENDIX H – WATER RIGHT SELF-ASSESSMENT

# Water Right Self-Assessment Form for Water System Plan

Mouse-over any link for more information. Click on any link for more detailed instructions.

| Water Right Permit, Certificate, or Claim # *If water right is interruptible, identify limitation in yellow section below | WFI Source # If a source has multiple water rights, list each water right on separate line | Existing Water Rights Qi= Instantaneous Flow Rate Allowed (GPM or CFS) Qa= Annual Volume Allowed (Acre-Feet/Year) This includes wholesale water sold | | | | Current Source Production – Most Recent Calendar Year Qi = Max Instantaneous Flow Rate Withdrawn (GPM or CFS) Qa = Annual Volume Withdrawn (Acre-Feet/Year) This includes wholesale water sold | | | | 10-Year Forecasted Source Production (determined from WSP) This includes wholesale water sold | | | | 20-Year Forecasted Source Production (determined from WSP) This includes wholesale water sold | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Primary Qi Maximum Rate Allowed | Non-Additive Qi Maximum Rate Allowed | Primary Qa Maximum Volume Allowed | Non-Additive Qa Maximum Volume Allowed | Total Qi Maximum Instantaneous Flow Rate Withdrawn | Current Excess or (Deficiency) Qi | Total Qa Maximum Annual Volume Withdrawn | Current Excess or (Deficiency) Qa | Total Qi Maximum Instantaneous Flow Rate in 10 Years | 10-Year Forecasted Excess or (Deficiency) Qi | Total Qa Maximum Annual Volume in 10 Years | 10-Year Forecasted Excess or (Deficiency) Qa | Total Qi Maximum Instantaneous Flow Rate in 20 Years | 20-Year Forecasted Excess or (Deficiency) Qi | Total Qa Maximum Annual Volume in 20 Years | 20-Year Forecasted Excess or (Deficiency) Qa |
| 1 G 6636-A | SO6: Well 5 | 600 | | 920 | | 500 | 100 | 28 | 892 | | | | | | | | |
| 2 G 6635-A | SO7: Well 6 | 1,500 | | 2,400 | | 1,000 | 500 | 158 | 2,242 | | | | | | | | |
| 3 G2-00501 | SO8: Well 7 | 1,000 | | 530 | | 1,000 | | 266 | 264 | | | | | | | | |
| 4 G2-24400 | SO9: Well 8 | 900 | | 530 | | 900 | | 316 | 214 | | | | | | | | |
| 5 G2-CV1-2P160 (Cert. of Change No. 121023) | SO15: Well 1 (Transferred to Well 10) | 900 | | 230 | | 900 | | 158 | 72 | | | | | | | | |
| 6 G 85-A | SO13: Well 3 (Transferred to Well 11) | 1,200 | | 118 | | 1,200 | | 118 Note: G2-30144 exercised at this well. | | | | | | | | | |
| 7 G2-CV1-2P159 (Cert. of Change No. 121022) | SO14: Well 2 (Transferred to Well 12) | 900 | | 320 | | 900 | | 320 Note: G2-30144 exercised at this well. | | | | | | | | | |
| 8 G2-30144 | Expanded Washougal Wellfield- Wells 4-8, 10, 11, 12 | 500 | | 2,150 | | 450 | 50 | 1,712 | 438 | | | | | | | | |
| 9 G 4072-A | SO16: Well 4 (Transferred to Well 13) | 1,325 | | 1,208 | | 1,325 | | 1,208 Note: G2-30144 exercised at this well. | | | | | | | | | |
| 10 G2-27384 | SO11: Well 9 | 650 | | | 210 | 650 | | 108 | | | | | | | | | |
| 11 G2-30145 | S17: Well 14 | 1,000 | | 880 | | 1,000 | | 331 | 549 | | | | | | | | |
| 12 G2-30146 | Parkers Landing | 1,000 | | 880 | | | 1,000 | | 880 | | | | | | | | |
| 13 G2-30147 | Treatment Plant Well | 1,000 | | 880 | | | 1,000 | | 880 | | | | | | | | |
| 14 S711 CS2—SWC 711 | S02: Jones Creek | 450 (1 cfs) [1] | | 730 [1] | | 450 | | | | | | | | | | | |
| 15 S712 CS2-SWC 712 | S01: Boulder Creek | 1,120 (2.5 cfs) [1] | | 1,820 [1] | | 1,120 | | | | | | | | | | | |
| | **TOTALS =** | 14,045 | | 11,090 | | 11,395 | 2,650 | 4,723 | 6,367 | 13,300 | 745 | 7,780 | 3,310 | 17,770 | (3725) | 10080 | 1,010 |
| Column Identifiers for Calculations: | | A | | B | | C | =A-C | D | =B-D | E | = A-E | F | =B-F | G | =A-G | H | =B-H |

**PENDING WATER RIGHT APPLICATIONS:** Identify any water right applications that have been submitted to Ecology.

| Application Number | New or Change Application? | Date Submitted | Quantities Requested | | | |
|---|---|---|---|---|---|---|
| | | | Primary Qi | Non-Additive Qi | Primary Qa | Non-Additive Qa |
| G2-121022CL | New Well | 09/04/2001 | 350 gpm | | 300 AFY | |
| G2-121023CL | New Well | 09/04/2001 | 1,000 gpm | | 1,200 AFY | |

**INTERTIES:** Systems receiving wholesale water complete this section. Wholesaling systems must include water sold through intertie in the current and forecasted source production columns above.

| Name of Wholesaling System Providing Water | Quantities Allowed In Contract | | Expiration Date of Contract | Currently Purchased Current quantity purchased through intertie | | | | 10-Year Forecasted Purchase Forecasted quantity purchased through intertie | | | | 20-Year Forecasted Purchase Forecasted quantity purchased through intertie | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Maximum Qi Instantaneous Flow Rate | Maximum Qa Annual Volume | | Maximum Qi Instantaneous Flow Rate | Current Excess or (Deficiency) Qi | Maximum Qa Annual Volume | Current Excess or (Deficiency) Qa | Maximum Qi 10-Year Forecast | Future Excess or (Deficiency) Qi | Maximum Qa 10-Year Forecast | Future Excess or (Deficiency) Qa | Maximum Qi 20-Year Forecast | Future Excess or (Deficiency) Qi | Maximum Qa 20-Year Forecast | Future Excess or (Deficiency) Qa |
| 1 | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | |
| **TOTALS =** | | | | | | | | | | | | | | | |
| Column Identifiers for Calculations: | A | B | | C | =A-C | D | =B-D | E | =A-E | F | =B-F | G | =A-G | H | =B-H |

**INTERRUPTIBLE WATER RIGHTS:** Identify limitations on any water rights listed above that are interruptible.

| Water Right # | Conditions of Interruption | Time Period of Interruption |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |

**ADDITIONAL COMMENTS:**

[1] S01 Boulder Creek and S02 Jones Creek surface water diversions cease between May 15th and October 31st of each year as required by G2-30144

# APPENDIX I – WELLHEAD PROTECTION

PACIFIC groundwater GROUP

# CITY OF CAMAS
# HYDROGEOLOGY SUMMARY AND
# WELLHEAD PROTECTION ASSESSMENT REPORT

**November 30, 2016**

# CITY OF CAMAS
# HYDROGEOLOGIC SUMMARY AND WELLHEAD PROTECTION ASSESSMENT REPORT

***Prepared for:***

**City of Camas**
**616 NE Fourth Ave**
**Camas, Washington 98607**
**360-817-1563**
**www.cityofcamas.us**

***Prepared by:***

**Pacific Groundwater Group**
**2377 Eastlake Avenue East, Suite 200**
**Seattle, Washington 98102**
**206.329.0141**
***www.pgwg.com***

***November 30, 2016***
***JM9702.20***
***WHPP_Camas_2016_Final***

# TABLE OF CONTENTS

## TABLES



## FIGURES



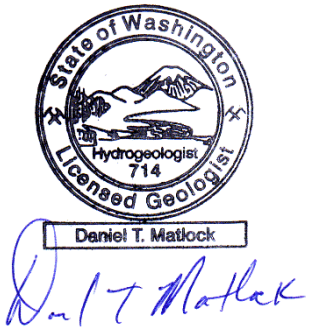
## APPENDICES

# LIST OF ACRONYMS

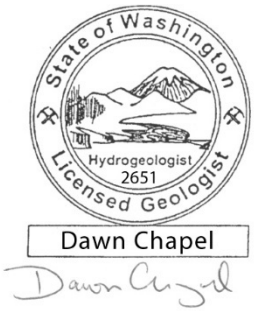
| | |
|---|---|
| BNSF | Burlington Northern Santa Fe |
| CARA | Critical Aquifer Recharge Area |
| CAP | Cleanup Action Plan |
| cPAH | Carcinogenic Polycyclic Aromatic Hydrocarbons |
| CUL | Cleanup Levels |
| DBCP | Dibromochloropropane |
| EDB | Ethylene Dibromide |
| EPA | Environmental Protection Agency |
| FSID | Facility Site Identification |
| GIS | Geographic Information System |
| GP | Georgia Pacific |
| LUST | Leaking Underground Storage Tank |
| MCL | Maximum Contaminant Level |
| MODFLOW | Modular Three-Dimensional Finite-Difference Ground-Water Flow Model |
| MTCA | Model Toxics Control Act |
| NPDES | National Pollutant Discharge Elimination System |
| PAA | Pleistocene Alluvial Aquifer |
| PAH | Polycyclic Aromatic Hydrocarbons |
| PCB | Polychlorinated Biphenyls |
| RA | Remedial Assessment |
| SGA | Sand and Gravel Aquifer |
| SHA | Site Hazardous Assessment |
| SSL | Site Screening Level |
| SWMP | Stormwater Management Plan |
| UST | Underground Storage Tank |
| VCP | Voluntary Cleanup Program |
| VOC | Volatile Organic Compound |
| WAC | Washington Administrative Codes |
| WDOT | Washington Department of Transportation |
| WHPA | Wellhead Protection Area |

## SIGNATURE

This report, and Pacific Groundwater Group's work contributing to this report, were reviewed by the undersigned and approved for release.




**Dan Matlock**
Principal Hydrogeologist
Washington State Hydrogeologist No. 714




**Dawn Chapel**
Associate Hydrogeologist
Washington State Hydrogeologist No. 2651

# 1.0 INTRODUCTION

This report summarizes the hydrogeology, municipal wellhead protection area ("WHPA") delineations, and contaminant risks to groundwater supplies for the City of Camas ("the City"). Information presented in this report supports an update of the City's Water System Plan ("WSP") currently being prepared for the City by Carollo Engineers. The purpose of this report is to help the City better manage its groundwater supply wells and to better understand the contaminant risks posed to these sources. Elements of the report were developed following the Washington State Department of Health guidelines for Wellhead Protection Programs (WSDOH, 2010).

The study area for this investigation focuses on the City's nine shallow supply wells that lie in close proximity to the lower Washougal River (**Figure 1**). The City also operates one deeper supply well in the Lacamas Lake area (Well 9). This well is used primarily for supply during peak demand. Well construction and land use conditions limit the susceptibility and vulnerability of this source; therefore, it was not reviewed as part of this investigation.

This report is organized in six sections:

**Section 1: Introduction**. This section contains background information on the report.

**Section 2: Hydrogeologic Framework**. This section presents the regional and local hydrogeologic features that are pertinent to the City's groundwater supplies. It describes the deposits that form aquifers and aquitards, and describes the movement of groundwater through these deposits.

**Section 3: Wellhead Protection Area Delineations**. This section discusses the methods used to delineate the WHPAs and presents the results of the analysis. Time-related capture zones are presented for the Lower Washougal Wellfield area.

**Section 4: Risk Assessment**. This section presents an inventory of confirmed and potential sources of contamination, particularly those that lie within the wellhead capture zones. An evaluation of risks associated with these sources is also presented.

**Section 5: Contingency Plan**. This section presents options for alternative potable water supplies and mitigation should the City's groundwater supplies become impacted by contamination.

**Section 6: Spill and Incident Response Planning**. This section presents the local and regional agencies responsible for emergency incident/spill responses. Local agencies will be provided notification of the city's WHPA and contact information should an incident/spill occur that could potentially impact the City's water supply.

This work was performed, and this report prepared, in accordance with generally accepted hydrogeologic practices at this time and in this area for the exclusive use of the City of Camas for specific application to the study area. No other warranty, expressed or implied, is made.

# 2.0 HYDROGEOLOGIC FRAMEWORK

The following sections characterize the hydrogeology and source aquifer for the City's water supply.

## 2.1 GEOLOGY AND HYDROGEOLOGY

The geology of the greater Clark County region and the study area is commonly divided into older rocks and younger sediments, which are semi-consolidated or unconsolidated. The older rocks crop out in the foothills and mountains in the north and east portions of Clark County, and occur at depth in the central and western portions of the County. Within the Camas study area, the older rocks crop out north and east of the Washougal River. The younger sediments crop out in all other areas, and contain all of the principal aquifers noted in the County. The sedimentary units, with depth from youngest to oldest, consist of:

- Recent alluvial deposits
- Pleistocene alluvial deposits (aka "outburst flood deposits")
- Troutdale formation

Surface outcrop patterns for these units in the City of Camas area are shown on **Figure 1**, along with an alignment for a hydrogeologic cross section A-A' shown in **Figure 2**. The main focus of attention for the existing Camas groundwater sources is the Pleistocene alluvial deposits that occur in the Lower Washougal River lowland, discussed further below. All but one of the City's active supply wells (Wells 5 - 8 and Wells 10 - 14) are completed in these deposits.

The Troutdale formation does not occur in the immediate vicinity of the City's wellfield but underlies the Pleistocene alluvial deposits further east of the wellfield and is an important source of water in other parts of the Clark County. Throughout most of the county, the Troutdale formation contains three coarse-grained units that are separated by finer-grained confining units. The coarse units are:

- The Upper Troutdale unit – variably cemented gravel in a matrix of sand and silt;
- The Lower Troutdale unit – relatively discontinuous occurrence of fine sand; and,
- The "SGA" - a deeper sand and gravel unit.

## 2.2 RECENT AND PLEISTOCENE ALLUVIAL DEPOSITS

The following sections characterize the hydrogeology and susceptibility of the Recent and Pleistocene Alluvial deposits which together forms the City's main source aquifer.

### 2.2.1 Deposits Origin, Texture, Distribution

Recent floodplain alluvium consisting of silt, sand, and gravel occurs along many of the rivers and streams in the study area, including Lacamas Creek and the Columbia,

Washougal, and Little Washougal rivers. The recent floodplain alluvium generally occurs in narrow bands (less than 1,000 feet wide) along these rivers and streams, with thicknesses ranging from several feet to 10 or 20 feet.

During the late Pleistocene time, the ancestral Columbia River deposited a great deltaic fan emanating to the west from the mouth of the Columbia Gorge during a series of catastrophic flood events known as the "Missoula floods." Sedimentary textures can be similar to those of the recent alluvium, which overlies the Pleistocene alluvium along streams and rivers. Due to textural similarities between Recent and Pleistocene alluvium, a hydrogeologic distinction is not necessary between the two units.

The combined Recent and Pleistocene alluvial deposits comprise the main aquifer which is approximately 100 feet thick in vicinity of the City's Lower Washougal Wellfield, and is underlain by clay and locally by bedrock. The City of Camas occurs near the eastern limit of the area scoured by catastrophic Columbia River flooding during late Pleistocene times. Therefore, the sedimentary basin comprised of these deposits at Camas is small compared to portions of Clark County farther to the west. The older bedrock exposed to the north is relatively impermeable and functions as a no-flow groundwater boundary.

### 2.2.2 Aquifer Definition, Recharge, Production, Capture

The Pleistocene Alluvial Aquifer (PAA), defined as the combination of the Recent and Pleistocene alluvial deposits found along the Columbia and lower Washougal rivers, is the principal aquifer in the Lower Washougal lowland. The aquifer is recharged by incident precipitation, and induced recharge from the incised Columbia and Washougal rivers.

The productive zone of the aquifer is described on drillers' logs as a loose mixture of gravel, cobbles, boulders and little sand. Depending on the thickness of saturation, this aquifer can be very productive with well yields in excess of 1,000 gallons-per-minute (gmp). Immediately north and east of the Washougal River, where this aquifer pinches out on top of bedrock or Troutdale deposits, well yields are likely to be significantly lower. Nine of ten City production wells are completed in the PAA including Well 5 - 8, and Wells 10 – 14[1]. The water supply sources are collectively referred to as the Lower Washougal wellfield as shown on **Figure 1**. Groundwater in the PAA in the vicinity of the Lower Washougal wellfield area occurs under unconfined conditions. Unconfined aquifers have no overlying confining layer and have water tables that occur at atmospheric pressure.

Two new supply wells (Parkers Landing and Treatment Plant) are being planned for installation in the Lower Washougal wellfield (**Figure 1**). Well #14 recently went into production in 2010. These newer wells are intended to meet future city growth and also serve as replacement supplies for Boulder and Jones Creeks that are shut down during low-flow months (May 15 – October 31) to improve fish habitat. These new supply wells are being installed under water right permits that were issued by the Department of Ecology in 2008 after seven years of extensive study and negotiations.

[1] The City's tenth supply well (Well 9) is completed in the Upper Troutdale Aquifer.

Groundwater flow directions in the PAA are relatively dynamic because the hydraulic connection to the Washougal and Columbia rivers causes groundwater levels to move up and down with the tides and with seasonal changes in runoff. Pumping at industrial supply wells operated by Georgia Pacific also influences water levels in the PAA. Georgia Pacific owns and operates as many as 17 industrial supply wells that are completed at depths of approximately 50 to 120 feet in the PAA. Total production from the Georgia Pacific wellfield may exceed 25 million-gallons-per-day (mgd) at times. This large-scale pumping has a significant effect on water levels within City production wells with large declines occurring during peak industrial supply periods.

### 2.2.3 Aquifer Susceptibility

The sensitivity of the City's groundwater sources to potential contamination was evaluated by assessing the relative susceptibility and vulnerability of the City's primary production aquifer. Aquifer susceptibility refers to the estimated ease of contaminant transport from the land surface to the aquifer. Some of the primary factors influencing aquifer susceptibility are the thickness and permeability of the sediments overlying the aquifer. Shallow aquifers are typically more susceptible to surficial contaminants than deeper aquifers. Aquifers overlain by highly permeable sediments such as sand and gravel are also at higher risk than aquifers overlain by lower permeability sediments such as silt or clay. In the vicinity of the Lower Washougal wellfield, coarse grained soils typically extend from ground surface to the water table which lies at depths of 30 to 50 feet. Drillers' logs from wells in the area indicate no laterally extensive low permeability layers exist between land surface and the underlying PAA. The combination of a shallow depth to water and relatively high permeability of the overlying sediments indicate the PAA has relatively high susceptibility to contamination.

Aquifer vulnerability combines the aquifer susceptibility discussed above, with an evaluation of the availability of contaminants at land surface, and the likelihood of a contaminant release. In general, aquifer susceptibility is a function of stratigraphy and hydrogeology, and cannot be substantially modified. The potential for contaminant release on the other hand is controllable, and can be reduced in areas where susceptible aquifers are utilized as a major source of potable water. One of the primary purposes of a water system's wellhead protection plan is to evaluate the susceptibility of the systems aquifer(s), and the potential sources of contamination within the systems capture zones. Additional attention to potential contamination sources is recommended within the capture zones of high susceptibility aquifers, to reduce the likelihood of a contaminant release. This is especially true for potential contaminant sources within the shorter duration capture zones, such as the 1-year capture zone shown in **Figure 3**.

## 3.0 WHPA DELINEATIONS

The following sections describe the model used to delineate the City's wellhead protection areas (WHPA) and capture zone analysis.

## 3.1 WHPA MODEL

The "capture zone" for the Lower Washougal wellfield was estimated using the groundwater flow model MODFLOW, a finite difference numerical model originally developed by the US Geologic Survey (McDonald and Harbaugh, 1988). A capture zone is the area that supplies groundwater recharge to a pumping well, or wellfield—in other words, its "zone of contribution." In natural systems, capture zones are not circular but elongated, with most of the capture occurring from areas that lie hydraulically up-gradient of the wellhead. Each capture zone has a stagnation point—the furthermost "point of capture" down-gradient of the wellhead. A time-related capture zone is the area in the aquifer that supplies ground-water recharge to a pumping well within a specified time period. Time-related capture zones provide a basis for developing monitoring plans, land-use inventories, and data collection plans. They are used in conjunction with the results of the aquifer vulnerability assessment.

The groundwater flow model developed for the Lower Washougal and Columbia River lowlands depicts the two major aquifers in the study area (PAA and SGA), the occurrence of bedrock, the Columbia and Washougal rivers, recharge from precipitation, and groundwater inflow from areas outside the model domain (PGG, 2004 and 2007). The model simulates three-dimensional flow in its two layers (one for each aquifer), and includes model cell sizes ranging from 100 feet square to 600 feet square. Model boundary conditions include cells that represent the rivers, pumping wells, specified inflows from outside the model domain, and incident recharge applied to the top of the uppermost aquifer. The model was calibrated to observed summer drawdowns in the City's Washougal Wellfield vicinity, summer seepage losses from the Washougal River, and groundwater level responses to tidal fluctuations and runoff events in the Columbia River.

The calibrated model was used to perform predictive simulations which included evaluation of capture zones for the Lower Washougal wellfield. The simulations assumed that the City would exercise all of their water rights and operation of the two future wells (Treatment Plant and Parkers Landing). This assumption provides for a fairly conservative assessment of the capture zone extent. In addition, a high-end pumping was assumed for the Georgia Pacific wellfield (37.5 mgd).

## 3.2 CAPTURE ZONE ANALYSIS

Estimated capture zones for 6-month, 1-year, and 5-year times of travel for the Lower Washougal wellfield area are shown on **Figure 3**. All groundwater in the recharge area is younger than 10 years, therefore there is no need for a 10-year time-of-travel delineation. The shape and extent of these capture zones are influenced by pumping at the Georgia Pacific wellfield, and aquifer boundaries including the Washougal and Columbia Rivers and older bedrock exposures to the north. Capture for Well 13 is primarily to the northeast, extending to the approximate boundary where the PAA is pinched out by older bedrock. Capture for the proposed Treatment Plant Well extends southeast toward the Columbia River. Capture for the remaining Lower Washougal wells extends to the east, between the Columbia and Washougal rivers. Evaluation of mass-balance calculations for the groundwater flow model indicate that the majority of water captured by the Lower Washougal wellfield originates as flow within the PAA, that otherwise would have discharged to the Columbia and Washougal rivers.

The estimated capture zones were generated using a steady state groundwater flow model, meaning that only the long-term average rates of withdrawal were simulated. Variations in pumping, recharge and boundary conditions such as river stage are not simulated in a steady state model. As a result, **Figure 3** shows the average positions of the capture zones, not the temporal variations in the capture areas. Increased pumping during peak use months will result in variations of the predicted capture zones beyond the long-term average estimates shown in **Figure 3**. In order to account for the uncertainties associated with temporal variations in capture zone, an additional capture zone labeled Critical Aquifer Recharge Area (CARA) is shown. This zone includes areas that were not included in the simulated steady state capture zone analysis, but likely will contribute recharge during certain times of the year given variations in pumping, river elevation, and natural recharge.

# 4.0 RISK ASSESSMENT

The following sections present an inventory of confirmed and potential sources of contamination located within the WHPA and an evaluation of risks associated with these sources.

## 4.1 DATA SOURCES

Potential contaminant risks that lie within the vicinity of Camas' Lower Washougal Wellfield were investigated and mapped using data from two sources. The first, a parcel database that contains information on land use and zoning, was provided by Clark County 2016. The second contains data from the Washington State Department of Ecology's Facility / Site database, including state cleanup sites, federal superfund sites, hazardous waste generators, solid waste facilities and underground storage tanks. The information from these sources were classified and plotted on GIS coverages to assess whether existing and potential contaminant sources were located within the vicinity of Camas' production wells and WHPA delineations[2].

## 4.2 CURRENT LAND USE AND ZONING

Clark County's database contains a description of the land use within each parcel in the study area. A GIS analysis was used to identify land uses that could pose a risk to groundwater within the vicinity of the City's wellfield. Parcels where such land uses were identified were designated "parcels of concern." This approach provides a way to assess potential sources of contamination. The "parcels of concern" include those where potential activities could result in a release of contaminants to groundwater. **Table 1** summarizes the land use categories that are considered to be of concern and **Table 2** summarizes the individual parcels with those categories within the WHPA.

**Figure 4** shows the distribution of zoning throughout the study area. It also shows the parcels of concern that occur within the City's capture zone areas. Parcels of concern are

[2] Some locations from Ecology's Facility database were adjusted in Figure 5 based on facility address, parcel information, and Google Earth imagery.

shown as green cross-hatched areas. For the Lower Washougal wellfield, 30 parcels of concern occur in the 6-month capture zone, 11 parcels fall within the one-year capture zone, and 24 parcels fall within the 5year capture zone. Two additional parcels fall outside of the capture zones, but within the defined CARA. Parcels of concern that fall within the various capture zones should be considered as potential contaminant sources, with the shorter time of travel zones being more critical for risk management.

Current zoning information from the County's GIS was also used to evaluate current and future land-use in the study area. The following zoning categories were mapped (**Figure 4**):

- Industrial
- Commercial
- Residential
- Parks

The most common allowed land use within the Lower Washougal wellhead protection capture zone is residential followed by commercial and industrial. Areas zoned as commercial and industrial are most likely to comprise threats to groundwater quality. Most of the allowed commercial and industrial use is concentrated along SR-14, the southern terminus of SR-500, the railroad corridors, SE 3rd and 6th Avenues, and E. Street.

## 4.3 CONTAMINANT SOURCES

**Table 3** summarizes known environmental sites of potential concern within the Lower Washougal Wellfield wellhead protection capture zones. Thirty-six contaminant sources of potential concern to the water supply were identified within the Lower Washougal wellfield capture zone. **Figure 5** displays the location of each of these sites and indicates through the location symbols which types of activities or risk are associated with each site. Each site marker has three pie slices which indicate the type of activities associated with the site as follows:


Underground Storage Tanks (UST/LUST)


Cleanup Site (State Cleanup or Voluntary Cleanup)


Hazardous Material Generator or Handler

Any combination of the three indicators is possible. In addition to the pie slices, a red circle around the outside of the pie indicates that a release to either groundwater, surface water, or soils has occurred at that site. Site markers without any pie slices filled in indicate the facility is tracked in Ecology's facilities database, and the facility type is considered to have risk to groundwater, but the facility is not a cleanup site, a hazardous materials handler, nor does it have registered underground storage tanks.

### 4.3.1 Contaminant Sources with Known Releases

**Table 3** indicates seven confirmed sites with known contaminant releases occur in the Lower Washougal wellfield capture area. Confirmed contaminant release sites are shown on **Figure 5**. All seven are listed as a State Cleanup Site and three of the seven are associated with Leaking Underground Storage Tanks (LUST)

A brief discussion of each site and current status follows with additional information provided in Appendix A

#### 4.3.1.1 Chevron Bulk Plant (FSID 1043, Map ID=5)

The Chevron Bulk Plant site is a decommissioned bulk fuel facility with historic releases of contaminants to soil and groundwater located at SE 6th Avenue and SE Union Avenue. The site is located in close proximity to City Well 6. A Site Hazardous Assessment (SHA) was originally completed for the site in 1995, and back then Ecology assigned a ranking of "2" to this site, indicating the site posed a serious threat to human health and the environment. Early investigative work conducted during the 1990's included soil borings and sampling, installation of groundwater monitoring wells, and remedial excavation of an old sump and 830 cubic yards of impacted soils. Contaminants of concern at the site include petroleum products in soil and groundwater and priority pollutant metal (lead) in soil. In 2003, Chevron entered into an agreed order with Ecology to conduct a formal Remedial Investigation, Risk Assessment, and Feasibility Study (RI/RA/FS) under MTCA and to implement any corrective actions identified in the RI/RA/FS. Additional soil borings and monitoring wells were installed between 2004 and 2014. The RI was completed in 2015 and results indicate soil and groundwater concentrations do not exceed established cleanup levels. Ecology's site manager, Craig Rankine, states that groundwater quality is no longer a concern at this site, very minimal levels of contamination remain in surface soils, and the site is moving toward being delisted (personal communication 10/25/16).

#### 4.3.1.2 Hambleton Bros. Log Yard (FSID 4399598, Map ID=11)

The Hambleton Bros. Log Yard is a historic lumber mill along the Columbia River located at 335 South A Street, now managed by the Port of Camas-Washougal. Site investigations and interim actions have taken place at the site since 2002 and a Focused Site Assessment was conducted in 2011 to evaluate the nature and extent of contamination at the site. Site investigations indicate contaminants above MTCA Method A cleanup levels (CULs) in groundwater, soil, log pond surface water, and log pond sediments. Contaminants found above CULs included:

- Groundwater: Petroleum hydrocarbons and arsenic.
- Soils (near log pond, mill area, and recycling center): Petroleum hydrocarbons, metals (arsenic, lead, and mercury), cPAHs, and PCBs.
- Log Pond Surface Water: metals, petroleum hydrocarbons, VOCs and PAHs
- Log Pond Sediments: VOCs and petroleum hydrocarbons
- Four sediment samples were also collected from the Columbia River were found to all be below Ecology's Freshwater criteria.

A cleanup action plan (CAP) was developed for the site in 2013 and implemented in 2014. Components of the CAP included dewatering the log pond, consolidating impacted soils into the empty pond, site grading, and capping of the log pond, former mill area and recycling area. Institutional controls to restrict future site use were also included. A No Further Action status was granted to the Port in 2015; however, the Port is required to continue groundwater compliance monitoring at MW-7 for petroleum hydrocarbons on an 18-month schedule until groundwater CULs are achieved.

#### 4.3.1.3 Columbia Rock Concrete Products (FSID 5016308, Map ID=7)

The Columbia Rock Concrete Products site is located at 1615 SE 6th Avenue, and has documented soil and groundwater contamination based on a 2001 investigation. The site is located immediately adjacent to several of the City's water supply wells. Operations at the site includes production of concrete moldings (primarily Jersey barriers and sound wall barriers). A site hazard assessment was completed by Clark County Public Health in 2007, with the site receiving a ranking of "2" indicating that it poses a serious threat to human health and the environment. Results of a Phase II Environmental Assessment completed in 2001 found impacts to soil and groundwater. Contaminants of concern (above MTCA Cleanup Levels) identified during the Phase II assessment are petroleum products (diesel, gasoline, and heavy range oils) in soils and metals (arsenic, chromium, lead and barium) in groundwater. The concentration of metals in groundwater were reported as:

- Arsenic = 73.1 µg/L (MTCA Level A = 5 µg/L)
- Chromium = 641 µg//L (MTCA Level A = 50 µg/L)
- Lead = 498 µg/L (MTCA Level A = 15 µg/L)
- Barium = 5880 µg/L (MTCA Level B = 3200 µg/L)

The site was placed on the national priorities list in 2007 and is awaiting a remedial assessment (RA). No other information or action has taken place at the site since these activities and Ecology has no plans for taking action in the immediate future (personal communication with Kirsten Alvarez at Ecology 10/31/16).

#### 4.3.1.4 Northwest Pipeline GP Washougal M/S (FSID 14447751, Map ID=14)

The Northwest Pipeline GP Washougal Meter Station (M/S) site is located at 30 C Street, Washougal. This site was participating in the VCP program for soil and mercury contaminants in soils. Early remedial action performed in 1991 consisted of removal of three drums of soil in a 14-square foot area. Further site assessment work was performed in 2006 and 2007 with collection of 75 surface and subsurface soils samples. Additional soils were excavated in 2007 and confirmation samples were below cleanup levels. The site was issued a No Further Action status by Ecology in 2012.

#### 4.3.1.5 Goodyear Tire Camas (FSID 85837922, Map ID=23)

The Goodyear Tire (Schuck's Auto Supply) site is located at 3440 3rd Avenue and participated in a voluntary cleanup for a leaking underground storage tank. The site was cleaned up in 1999 and subsequently classified as No Further Action by Ecology in 2001.

#### 4.3.1.6 Hi-Way Fuel (FSID 22538744, ID=29)

The Hi-Way Fuel site is a gas station with repair shop located at 1250 E Street in Washougal. Initial site characterization work began in 1996 for a leaking underground storage tank. During this time, older tanks were removed and impacted soils excavated to the extent possible. All tanks and pipes were upgraded to newer standards at this time. Some contaminated soils were left in place, but there is no information in current Ecology files indicating confirmed groundwater contamination (personal communication with Aaren Fiedler at Ecology 10/31/16). However, Ecology's online Cleanup Site report indicates confirmed petroleum contamination above cleanup levels in soil and groundwater at this site. Ecology sent a status update request letter to the owner in 2011, but there was no response. No other action has taken place at the site since these activities and Ecology has no plans for taking action in the immediate future (personal communication with Aaren Fiedler at Ecology 10/31/16).

#### 4.3.1.7 Camas Washougal Port (FSID 92847997, ID=4)

The Camas Washougal Port (Port Sider Store on the Marina) site is located at 24 South A Street in Washougal and conducted cleanup for a leaking underground storage tank. Initial site characterization and cleanup work began in 1990 with additional investigative work performed in 2011. The site was issued a No Further Action by Ecology in 2012.

### 4.3.2 Potential Sources

This section discusses potential sources of contamination within the wellhead protection capture zones based on Ecology's Facility database, and Clark County's parcel, stormwater, and septic system databases. The following potential contamination sources have been identified within or near the capture zones for the Camas wells:

- Hazardous materials
- On-site septic systems
- Underground storage tanks
- Stormwater
- Unused and improperly constructed wells
- Agriculture, golf courses, and parks
- Transportation corridors

#### 4.3.2.1 Hazardous Materials

The commercial use of chemicals poses a major threat to groundwater quality, since the chemicals can be accidentally spilled or disposed of improperly. The likelihood of such releases from spills can be reduced by proper methods of handling, spill prevention measures, and emergency response strategies. Risk reduction strategies should target on-site waste management practices. Improper disposal is likely the most common pathway for chemicals to be released into the environment. The following facility activity classifications were included as hazardous materials sites in this assessment:

| Activity Code | Definition |
|---|---|
| HWG | Facilities that generate any quantity of a dangerous waste. They may be classified as small, medium or large quantity generators (SQG, MQG, or LQG) depending on hazardous waste generated for a given month. |
| HWOTHER | Facilities that are required to have a RCRA Site ID# but who do not generate and/or manage hazardous waste (XQG generator status). This includes transporters, used oil recycler's, and dangerous waste fuel marketers and burners. |
| HWTRNSFR | Transfer facility is a site, owned, leased or operated by a transporter of regulated hazardous waste shipments where any of the following occurs: 1) receives wastes from another transporter, 2) transfers wastes from one transport vehicle to another, 3) transfers waste from one container to another, and 4) stores waste within a vehicle or on property for 10 days or less. Examples of transfer facilities include a parking lot, warehouse, truck terminal, barge or steamship loading and unloading facility, or railroad spur loading or unloading facility. |
| HWTSDF | Facilities that treat store or dispose hazardous waste. |
| TIER2 | Businesses that store 10,000 pounds or more of a hazardous chemical or 500 pounds or less, depending on the chemical, of an extremely hazardous chemical on site at any one time must report annually. Reports are sent to the State Emergency Response Commission [represented by Ecology], Local Emergency Planning Committees, and local fire departments for emergency planning. [product, not waste] |
| TRI | Facilities in specific industries that manufacture, process or use more than the threshold amount of one or more of 600 listed toxic chemicals. Most threshold amounts are 10,000 or 25,000 pounds per year. Some chemicals have much lower thresholds. |

The most significant threats to groundwater are related to the use and storage of solvents. Solvents are persistent, both soluble and insoluble in water, and highly mobile. A large plume of contamination can be created with a small quantity of solvent.

The Washington State Facility Site database indicates that there are 19 sites within the Lower Washougal wellfield that fall into one of the above hazardous waste classifications. Of these only 6 have active status (see below), the rest are inactive. Inactive status indicates that the sites do not have current permitting, and therefore, are not actively overseen by Ecology.

| Active Hazardous Materials Site | | | |
|---|---|---|---|
| **FSID** | **Facility name** | **WHPZ** | **Acivity Code** |
| 11338232 | COLUMBIA STORAGE INC 2ND ST | 6-Month | TIER2 |
| 37125488 | COLUMBIA WAREHOUSE | 6-Month | TIER2 |
| 3264254 | TARR INC WASHOUGAL | 6-Month | TIER2 |
| 88277363 | Tidland Corp | 6-Month | HWG |
| 38772238 | Camas City Operations Center | CARA | HWOTHER |
| 994431 | CAMAS CITY WELL 11 & 12 | CARA | TIER2 |

The facility site index database does not indicate whether sites listed are large or small hazardous waste generators.

#### 4.3.2.2 On-Site Septic Systems

On-site septic systems pose a risk to groundwater where they are relatively high in density and/or where hazardous wastes are discharged to them. Potential contaminants from septic systems include pathogenic organisms (bacteria and parasites), toxic substances, and nitrogen compounds.

The extent to which pathogens are transported in the subsurface away from a septic drain field depends on the type of pathogen and the chemical and physical conditions in the subsurface. In general, if a septic system is properly sited, constructed, and maintained, the transport of microorganisms will be limited. Household hazardous chemicals such as cleaners, polishes, waxes, and paints can be transported to groundwater via a septic system. Some products contain toxic and persistent chemicals that can cause low-level contamination when coupled with a high density of septic systems. Homeowners can improperly apply or dispose of chemicals because they do not understand the threat they pose to groundwater quality. In some areas, business and commercial facilities still use on-site septic systems for sewage disposal. Business, commercial, and industrial operations that utilize on-site systems need to take special precautions to avoid contamination of their wastewater.

Ammonia and nitrate are highly soluble in water and can be expected in detectable quantities wherever portions of an aquifer are affected by septic system discharges. Septic systems are a source of nitrates in groundwater throughout Clark County. Nitrate is regulated, since ingestion can result in methemoglobinemia, or “blue baby” syndrome. Other sources of nitrate include fertilizers, feedlots, and natural mineral deposits. Background concentrations of nitrates in groundwater are typically less than 1 milligram of nitrogen per liter (mg-N/L). The maximum contaminant level (MCL) for nitrate is 10 mg-N/L.

Although significant portions of the urban areas are served by sewer systems, many residents still rely on septic systems. Clark County maintains a GIS coverage of on-site septic system locations, locations that are based on information provided by the Clark County Public Health Department. The locations of the septic systems are plotted on **Figure 5**. This figure indicates that the Lower Washougal wellfield capture zone has only 2 identified septic system within the 6-month capture zone, 3 systems within the 1-year capture zone, and 27 systems within the 5-year capture zone. Overall, 32 septic systems fall within the Lower Washougal Critical Aquifer Recharge Area.

#### 4.3.2.3 Underground Storage Tanks

Contamination in soil and groundwater caused by leaking USTs ("LUSTs") is a major environmental, legal, and regulatory issue. The most common causes of leaks are structural failure, corrosion, improper fittings, improper installation, and natural phenomena. Although USTs usually contain flammable motor fuels or heating oils, they may contain other compounds used by industry, government, or business.

Leakage from USTs and associated piping can often occur without detection. Even relatively small amounts of certain compounds can adversely impact groundwater quality. Once released from an UST, some VOCs and petroleum products can rapidly migrate to groundwater, a problem that is especially serious in areas with permeable soils such as the sand and gravel comprising the PAA.

Of the many materials stored in USTs, solvents are considered the most toxic. However, petroleum products may pose a greater total risk because of the prevalence of tanks containing petroleum products. In addition, petroleum products contain many potential contaminants, including three EPA priority pollutants: benzene, toluene, and ethylbenzene. Benzene is a known human carcinogen.

**Figure 5** shows the locations of USTs in the WHPA. These sites were identified from the Ecology's UST site data. Most of them lie along the railroad corridor and within areas zoned industrial and commercial. There are 14 registered underground storage tank (USTs) facilities located within the wellhead protection capture zones. However, the tanks at 9 of these facilities have been removed or closed in place with no reports of leaks and are no longer active (**Table 3**). Of the 5 active USTs, there are only 3 large facilities (>15,000 gallons total volume) in operations (**Table 3**): Camas Washougal Port (6-month capture zone); Jimbo's Deli Mart (6-month capture zone); and Hi Way Fuel (5-year capture zone). The tanks at these facilities have been upgraded to standards developed in the mid-1990's and include double walls and leak detection systems.

There are 3 leaking underground storage tanks (LUSTs) identified in Ecology's database located within the wellhead protection capture zones; Camas Washougal Port; Goodyear Tire; and Hi Way Fuel. The first two sites have been cleaned up and received NFA notices (no further action) from Ecology, the third site is listed with Ecology as cleanup started. Further details about these three sites are provided above in Section 4.3.1.

#### 4.3.2.4 Storm Water

Storm water (i.e., urban runoff) is produced when rainfall or other precipitation accumulates faster than it can evaporate, be used by plants, or infiltrate to the subsurface. Urban

areas produce more runoff than rural areas because they have more impermeable surfaces, such as rooftops, driveways, streets, and highways. These surfaces not only promote runoff but they also reduce the infiltration that recharges groundwater supplies. Even grass lawns can produce more runoff than forests and pasture.

Storm water typically contains pollutants, such as sediment, nutrients, bacteria, oils and grease, metals, and other toxicants. Many of these contaminants come from air pollution, motor vehicles, application of pesticides and fertilizers, soil erosion, and pet feces. Roofing materials have also been identified as a diffuse source of metals in runoff, particularly zinc (Good, 1993). In general, contaminant concentrations in urban storm water are similar for all land uses with slightly higher nitrate concentrations in residential areas, and higher heavy metals concentrations in commercial areas. Concentrated sources of storm water contamination may also occur if undiluted pollutants (e.g., fertilizer, gasoline) are accidentally spilled or intentionally released and enter storm drains.

Storm water contamination has primarily been a concern for surface water pollution because most urban runoff is directed to streams, lakes, and other water bodies with fish and other aquatic life that are highly sensitive to common storm water contaminants. However, where storm water is discharged to infiltration areas, there is also potential for groundwater contamination.

### Potential Risk from Stormwater

Concern over potential groundwater contamination from storm water has been recognized by several governmental agencies in western Washington. Storm water-related impacts to water quality are of particular concern in industrial, commercial, and high-density residential development areas, where runoff volumes can be large. Consequently, storm water runoff from highways and roads can introduce contaminants such as heavy metals and organic priority pollutants, pesticides, and coliform bacteria into the groundwater system. Impervious surfaces in the commercial and industrial areas along SR-14, the southern terminus of SR-500, the railroad, and 3rd Avenue contribute substantial amounts of runoff in the Camas study area. Storm water runoff from lawns and agricultural areas can introduce nitrate, herbicides, pesticides, and bacterial contaminants.

In 2012, the Washington State Department of Transportation (WSDOT) installed a large stormwater infiltration facility between SE 11th Avenue and SR-14, near the City's wastewater treatment plant (**Figure 5).** PGG and the City communicated with WSDOT during the construction phase the need to protect water quality in the underlying PAA. The infiltration facility is located relatively close to the future proposed wells for the City (**Figure 5**) and is within the CARA boundary. The operation and performance of this facility should be evaluated as the City moves forward with developing these two nearby sources in the future.

### Stormwater Management in the Camas Area

Sam Adams, Utilities Manager at Camas Public Works provided most of the information about the City's storm water facilities for this section (personal communication, November 7, 2016). In addition, Clark County's GIS data were reviewed to assess the distribution of dry wells in the area.

All of the stormwater runoff in Camas flows to catchment basins, drainage ditches, biofiltration swales, exfiltration ponds or sedimentation ponds. Catchment basins and other surface storm water facilities filter out some pollutants before the water enters the subsurface or surface water environment. Near the Lower Washougal Wellfield area, most storm water is captured via catchment basins and then routed to the Washougal River via outfall pipes. The City's stormwater discharges are regulated under the Federal National Pollutant Discharge Elimination System (NPDES) Phase II permitting process. The permitting process requires that the City provide annual reports and updates to their stormwater management plan (SWMP). The city is in compliance with the all NPDES permitting requirements.

According to the City, there are no current drywells in the City of Camas stormwater system. Drywells previously used in the area of Oak Park and Goot Park in southeast Camas were abandoned and replaced with new storm water collections systems in the mid 1990's (PGG email communication with Jim Hodges of the City August 17, 2009). However, the Clark County GIS database shows 9 dry wells within city limits between Oak Park and Goot Park, located between HWY-14 and SE 6th Ave (**Figure 5**). These features are likely the City's abandoned and replaced dry wells and are incorrectly attributed in the County's database. The City should review this dataset with the County and make appropriate modifications to reflect current conditions.

In contrast to the City of Camas, Washougal has more than 100 dry wells. Most of the dry wells are in the older part of Washougal which includes the area bounded by 6th Street on the west, 32nd Street on the east, SR-14 on the south, and where Washougal River road crosses the Washougal River on the north. This area includes a portion of the 5-year capture zone for the City of Camas' Lower Washougal wellfield. Dry wells are the most common storm water facility in the older parts of Washougal, whereas surface storm water facilities are the most common in newer developments of Washougal. Similar to current engineering practices implemented by the City of Camas, all new construction of storm water facilities in Washougal include only surface storm water facilities such as biofiltration swales and retention ponds.

#### 4.3.2.5 Unused, and Improperly Constructed Wells

Well casings can provide a conduit between the ground surface and underlying aquifers. Improperly constructed or abandoned wells pose several potential problems. In wells with no surface seal, contaminants introduced near the wellhead can move downward outside the casing to underlying aquifers. Many older wells that were constructed before the implementation of the State's minimum well standards in WAC 173-160 (pre-1971) have no surface seal. Unused wells that have not been properly abandoned are left uncapped in many cases, posing a special risk because contaminants can be introduced directly into the aquifer. Unused wells also pose a risk when they are damaged during site redevelopment. Any of these situations can provide a conduit for contaminant movement.

Among the private wells in the Camas vicinity, a portion were constructed prior to adoption of Ecology's drilling standards in 1971 and therefore have a higher likelihood of improper construction. There is no inventory on the number or location of these wells; however, many of them may have been abandoned properly following the State's standards. Furthermore, public water supplies have served most of the Lower Washougal Wellfield area since the 1930's and therefore few private wells likely occur in this area.

#### 4.3.2.6 Agriculture, Golf Courses, Parks, and Lawns

Fertilizers, pesticides, and herbicides are applied to residential lawns, commercial landscaping, agricultural lands, and landscaped areas adjacent to roads. If optimally applied, these chemicals pose little threat to groundwater, however, applications are commonly not made correctly and groundwater contamination can result if fertilizers are applied in exceedance of the agronomic uptake rate. Excess nitrate from fertilizer will be recharged to the underlying groundwater system. Frimpter and others (1990) estimated that an average of 9 pounds of nitrate-N leached annually to groundwater from each 5,000-square-foot lawn. Landscaping activities can also be the source of pesticides and herbicides such as EDB, DBCP, and dicamba.

There are no agricultural parcels within the Lower Washougal Wellfield capture area and park turf is not a significant concern (**Figure 4**). Most of the park area within the 6-month capture zone are natural areas with the exception of Goot Park, which has managed turf. The City should coordinate with the parks department on the use of chemicals at the Goot Park given its proximity to the City's supply wells.

Residential lawns and other landscaping occur throughout the Lower Washougal wellfield. These are potential sources of nitrogen, pesticides and herbicides to the groundwater. The risk of groundwater contamination by these contaminants is high in the PAA because the aquifer is unconfined and groundwater is relatively shallow.

#### 4.3.2.7 Transportation Spills

Vehicles transporting hazardous material can be a source of groundwater contamination through accidents and resultant chemical spills. Hazardous materials are transported through Camas on a daily basis. The major transportation routes in the City of Camas include:

- SR-14,
- SR-500,
- Burlington Northern Santa Fe railroad, and
- NE 3rd Avenue/E St.

All of these transportation corridors go through the Lower Washougal wellfield capture zone and are very close to the individual supply wells. A major spill along any of these routes could adversely impact groundwater pumped from any well in the Camas supply wells.

**Potential Risk from Burlington Northern Santa Fe Railway**

In 2001, about 32 to 45 Burlington Northern Santa Fe (BNSF) freight trains were reported to pass through the Washougal area on a daily basis (pers. comm. Read Fay, BNSF), with roughly 25% of the containers potentially containing hazardous materials (including petrochemicals).

More recently, within the past few years, railroad transport of crude oil has increased in Washington state and may continue to do so. In 2014, the railroads reported 19 unit

trains of Bakken oil moving through Washington each week (Ecology, 2015 and EFSEC, 2016). Each "unit" train is made up of as many as 100 oil tank cars carrying a total of 3 million gallons of oil. By 2020, this number could increase from 19 to 137 trains a week, if full build out of proposed facilities in Washington state are permitted and export of oil through Washington state continues (Ecology, 2015).

The number of crude oil trains moving through the Camas-Washougal area could increase significantly if the new Vancouver Energy terminal facility is constructed at the Port of Vancouver. Application for the Vancouver facility is currently in the review process, but the proposal facility could handle up to four loaded unit trains per day, with each unit train composed of up to 120 oil tanks cars transporting a total of 360,000 barrels of crude oil per day (EFSEC, 2016). Most trains would run on the BNSF rail line through the Columbia Gorge and pass through the City of Camas on their way to the Vancouver terminal (EFSEC, 2016). The tank cars will be required to meet new USDOT specifications standards (DOT-117) which requires increased tank shell thickness, full height protection at each end, improved fittings/discharge valves, and reconfigured tank vents for automatic reclosing to reduce vulnerability to breaching or failure during a derailment.

Derailment of rail cars with hazardous materials is a serious potential contaminant source for the Lower Washougal wellfield since the BNSF tracks run directly over the source aquifer. Road crossings at rail tracks are of highest concern since there is increased risk of accident at these locations. There are three railroad crossings within the Lower Washougal Wellfield capture area (**Figure 5**). Two of the crossings are public with warning lights and rail guard (6th Street and 3rd Street) and one is private with only a stop sign. The private crossing leads to the main entrance for the Columbia Rock Concrete site at 1615 SE 6th Avenue adjacent to the main Lower Washougal Wellfield (**Figure 5**) and within the 6-month capture zone. Rail collision with large trucks entering or leaving the concrete facility increases the possibility of derailment at this location and is considered a potential risk for the wellfield.

The maximum speed of BNSF freight trains is reported to not exceed 45 to 50 miles per hour (pers. comm. Read Fay, BNSF). These low speeds and the durability of the tank cars minimize the possibility of a spill in the unlikely event of a derailment. BNSF maintains a spill response plan working with local fire departments, emergency response, and the Washington State Department of Ecology.

## 4.4 WELLHEAD SUSCEPTIBILITY/VULNERABILITY ANALYSIS

The sensitivity of the City's groundwater sources to potential contamination was evaluated by assessing the relative susceptibility and vulnerability of the Lower Washougal wellfield. Susceptibility refers to the estimated ease of contaminant transport from the land surface to the aquifer. Vulnerability accounts for the potential of contaminant releases at the land surface.

### 4.4.1 Alluvial Aquifer – Lower Washougal Wellfield

As described in Section 2.2, the PAA occurs in the floodplains of the Columbia and Washougal rivers and is predominantly comprised of permeable sand, gravel and cobble

deposits. Reported depth to groundwater in the aquifer is as little as 30 feet below land surface in supply wells completed at the Lower Washougal wellfield. While some fine-grained or cemented zones are noted above the shallow water table in drilling logs, in many cases they are absent in the logs of neighboring wells. Therefore, no laterally extensive low permeability layer exists between the land surface and the water table to protect the PAA from contaminants released at the land surface. The aquifer is therefore considered to exhibit relatively high susceptibility.

Several natural mechanisms exist for attenuation of pollutant loading to the alluvial aquifer. While these mechanisms are probably benefiting groundwater quality under current conditions, they do not reduce the aquifer's susceptibility rating. Percolation of recharge through the unsaturated zone (from the land surface to the water table) supports some reduction of selected contaminants via: (1) adsorption to particulates and oxides; (2) precipitation in aerated zones; and (3) biodegradation. However, the course texture of the sediments and general lack of organic matter suggests that the unsaturated zone offers minor contaminant attenuation relative to more silty, organic soils. Dilution via mixing with uncontaminated recharge in the unsaturated zone and the alluvial aquifer also serves to reduce contaminant concentrations. Because it is nearly certain that some contaminant loading occurs at the land surface (e.g., from known contaminated sites, urban runoff and septic systems), the fact that historic groundwater quality monitoring has detected minimal contamination supports the value of these two processes. However, lack of contaminant detection in the City's wells does not mean that contamination is not reaching the water table in adjacent areas. It is important to understand that these natural attenuation processes are not likely to offer sufficient protection against a significant contaminant spill or release at the land surface.

Aquifer vulnerability is typically expressed as a risk factor, calculated by multiplying ratings reflecting the ease of contaminant transport to the water table (susceptibility) by the potential for contaminant releases at the land surface. Thus, the risk of groundwater contamination depends both on the hydrogeologic framework and the activities conducted at the land surface. In the case of Camas, the PAA should be considered highly vulnerable to potential contamination. While active, known/confirmed sources of groundwater contamination are limited, potential sources of contamination include:

- Known and unknown UST's and LUST's;
- Hazardous waste generators;
- Industrially or commercially zoned areas and related parcels of concern;
- Dry wells and septic tanks;
- Transportation spills; and,
- Other potential sources.

# 5.0 CONTINGENCY PLANNING

The City is required to develop contingency water supply measures in case one or more of the City's sources is lost or compromised. Contingency planning is important because, even with careful planning, unforeseen incidents can occur.

The City's water supply sources consist of the following:

- Ten supply wells; nine shallow wells within the Lower Washougal wellfield (wells 5-8, and wells 10-14) and one deep well in the Lacamas Lake area (Well 9).
- Two surface water sources from tributaries to the Little Washougal River - Jones and Bolder Creeks (normally shut down May 15-October 31)
- Two Interties (Cities of Washougal and Vancouver)

As described above, the nine shallow wells within the Lower Washougal wellfield are most susceptible to contaminant risks given the hydrogeology and land surface activities. The capacity of the most productive wells in the Lower Washougal wellfield is about 1300 gpm. If the supply from one of these wells was lost or compromised, the City would have to rely on a combination of the other sources to meet summer time peak demands (other wells, interties, and emergency use of surface water sources).

Additional risks to the City's supply arises from the fact that five of the City's wells (wells 7, 8, 10, 11, and 12) are clustered in close proximity to each other (**Figure 5**). Several, if not all, of these wells could be impacted by a single contaminant release, such as a major railroad spill. Depending on the nature of impact to the wells, the City could perform immediate mitigation with changes in well pumping, treatment, blending of waters between wells, and other operational changes to meet demands; however, should multiple wells become impacted, the City may not be able to support the City's entire water demand on a sustainable basis, particularly during the high demand summer months. If multiple wells are impacted, the City may need to institute short-term rationing and pursue expedited drilling of additional wells.

# 6.0 SPILL AND INCIDENT RESPONSE AND PLANNING

As part of the wellhead protection program, the City must develop a spill and incident response plan and coordinate with local emergency responders, the Department of Ecology's Spill Operations Section, the Emergency Management Division of the Washington Military Department, the local health department, and any local emergency planning committee.

As part of that plan, the following contacts should be notified if a spill occurs within the WHPA.

## 6.1 SPILL RESPONSE CONTACT INFORMATION

A spill of any magnitude within the WHPA, must be report to Ecology's Southwest Regional Office and City personnel should be notified:

- Ecology (24 hour): 360-407-6300.
- Steve Wall, City of Camas Public Works 360-817-7899
- Sam Adams, City of Camas Operations Manager 360-817-1563, ext 4203

- Mike Stevens, City of Camas Water Supervisor (360) 817-1563 ext 4283

If necessary, the City will contact local first responders and other governmental agencies with jurisdiction in the WHPA and request their assistance:

- Police: 911
- Fire/Ambulance: 911
- Clark County Public Health 360-397-8000

If a spill cannot be contained, Safety Kleen, a cleanup contractor in Clackamas, Oregon should be contacted:

- Safety Kleen 503-655-5798

If a spill can be contained, it should be pumped into a containment tank. If there are no containment tanks on site, Baker Tanks can be contacted to provide one:

- Baker Tanks 503-775-7211

In case of a railway spill, BNSF railways General Director of Hazardous Material Safety should be notified (in addition to first responders and agencies above):

- Patrick Brady 917-352-3652 (office) or 817-821-1325 (cell)

## 6.2 WHPA NOTIFICATION LETTERS

In an effort to protect and coordinate spill response planning within the City's WHPA, notification letters will be sent to the following entities:

- Parcels of Concern within WHPA (Table 2)
- Owners of Environmental Sites of Potential Concern within WHPA (Table 3)
- Local Fire and Police Department
- Washington Department of Ecology
- BNSF Railways

Copies of the notification letter are provided in Appendix B.

# 7.0 REFERENCES

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Pacific Groundwater Group, 2007. Steigerwald Area Exploration & Testing Program, Draft Report, JM9702.08, May 2007.

Washington State Department of Health (WSDOH), 2010. Washington State Wellhead Protection Program Guidance Document. June 2010. DOH 331-018 (Revised)

Table 1. Summary of Land Use Types of Concern

| Parcel Land-Use Description | Number of Parcels Within CARA |
|---|---|
| Bio-filtration swales/ponds | 1 |
| Boats and marine accessories. | 1 |
| Drive through car wash | 7 |
| Electric power boosters, transformers, stations, rights-of-ways. | 1 |
| Electric power operating, maint., and repair build | 2 |
| Feedlots. | 1 |
| Fleet operation centers & storage | 4 |
| Gas storage tanks, pumping, distribution, pipeline | 2 |
| General repair & service garages | 8 |
| Health clinics: medical / dental / other | 1 |
| Medical & dental laboratories | 1 |
| Mfg - machinery | 4 |
| Mfg - miscellaneous | 1 |
| Motor vehicle dealers, new cars and small trucks, | 3 |
| Motor vehicle dealers, used cars and small trucks. | 1 |
| Parking lot: gravel, for adjoining building | 9 |
| Retail automotive and allied | 1 |
| Rock quarry, crushing, sand and gravel pits. | 3 |
| Serv station w/ tanks & pumps or card lock station | 1 |
| Service repair shop | 7 |
| Sewage related bldg or structure | 4 |
| Tire, batteries, parts and accessories dealers | 3 |
| Veterinarians / small animal hospitals. | 1 |

**Table 2. Summary Data for Parcels of Concern Within Camas Wellhead Protection Capture Zone**

| Parcel Serial Number | Owner Name | Owner Address | Site Address | Legal Description | Land-Use Description | Zoning | WHPZ |
|---|---|---|---|---|---|---|---|
| 89882000 | BRAMBLE ACRES LLC | 4206 NE 261ST AVE, CAMAS, WA, 98607 | 2459 NE 3RD LOOP, CAMAS, 98607 | #64 DAVID C PARKER DLC .50A | MEDICAL & DENTAL LABORATORIES | RC | 6-Month |
| 87021000 | BRG LLC | 340 NW ILWACO CT, CAMAS, WA, 98607 | 2456 SE 8TH AVE, CAMAS, 98607 | #1 LOT 1 SP3-341 3.12A | RETAIL AUTOMOTIVE AND ALLIED | HI | 6-Month |
| 87260000 | C B I LLC | 829 NW VIEW RIDGE CT, CAMAS, WA, 98607 | 2380 SE 8TH AVE, CAMAS, 98607 | ORCHARD HOME WASHOUGAL #2 LOT 9 .17A | MFG - MISCELLANEOUS | LI | 6-Month |
| 89932000 | CITY OF CAMAS | 430 NE EVERETT ST, CAMAS, WA, 98607 | | #192 DAVID PARK DLC 18.24A M/L | ROCK QUARRY, CRUSHING, SAND AND GRAVEL PITS. | OS | 6-Month |
| 87360000 | CITY OF CAMAS | 616 NE 4TH AVE, CAMAS, WA, 98607 | 1129 SE POLK ST, CAMAS, 98607 | ORCHARD HOME WASHOUGAL #1 LOT 16 3.02A | SEWAGE RELATED BLDG OR STRUCTURE | RC | 6-Month |
| 87365000 | CITY OF CAMAS | 616 NE 4TH AVE, CAMAS, WA, 98607 | | ORCHARD HOME WASHOUGAL #2 LOT 16 | SEWAGE RELATED BLDG OR STRUCTURE | RC | 6-Month |
| 91045163 | CITY OF CAMAS | 613 NE 4TH AVE, CAMAS, WA, 98607 | 175 SE YALE ST, CAMAS, 98607 | #163 DAVID C PARKER DLC 4.39A | ELECTRIC POWER BOOSTERS, TRANSFORMERS, STATIONS, R | SU | 6-Month |
| 127950000 | CLARK PUBLIC UTILITIES | PO BOX 8900, VANCOUVER, WA, 98668 | 345 1ST ST, WASHOUGAL, 98671 | #115 DAVID C PARKER DLC .96A | ELECTRIC POWER OPERATING, MAINT., AND REPAIR BUILD | CH | 6-Month |
| 87451000 | CORAL PROPERTIES LLC | 124 POMPANO RD, WOODLAND, WA, 98674 | 1846 NE 3RD AVE, CAMAS, 98607 | RIVER VIEW ADDN TO CAMAS #3 LOT 8 | MOTOR VEHICLE DEALERS, NEW CARS AND SMALL TRUCKS, | RC | 6-Month |
| 87460000 | CORAL PROPERTIES LLC | 124 POMPANO RD, WOODLAND, WA, 98674 | 1904 NE 3RD AVE, CAMAS, 98607 | RIVER VIEW ADDN TO CAMAS #1 LOT 9 | GENERAL REPAIR & SERVICE GARAGES | RC | 6-Month |
| 87452000 | CORAL PROPERTIES LLC | 124 POMPANO RD, WOODLAND, WA, 98674 | | RIVER VIEW ADDN TO CAMAS #4 LOT 8 & #3 LOT 9 | MOTOR VEHICLE DEALERS, NEW CARS AND SMALL TRUCKS, | RC | 6-Month |
| 700120000 | ENCON NORTHWEST LLC | 2140 S IVANHOE ST STE 100, DENVER, CO, 80222 | 1635 SE 6TH AVE, CAMAS, 98607 | BNSF LEASE BF31374 | ROCK QUARRY, CRUSHING, SAND AND GRAVEL PITS. | HI | 6-Month |
| 89861000 | ENCON PACIFIC LLC | 2140 S IVANHOE ST STE 100, DENVER, CO, 80222 | 1635 SE 6TH AVE, CAMAS, 98607 | #32 OF DAVID C PARKER DLC 4.98A | ROCK QUARRY, CRUSHING, SAND AND GRAVEL PITS. | HI | 6-Month |
| 87500000 | EPJLM LLC | 2845 NW LOGAN CIR, CAMAS, WA, 98607 | 2016 NE 3RD AVE, CAMAS, 98607 | RIVER VIEW ADD TO CAMAS #1 #4 LOT 10 #2 LOT 11 | HEALTH CLINICS: MEDICAL / DENTAL / OTHER | RC | 6-Month |
| 89908000 | NORTHWEST PIPELINE | PO BOX 2400 MD 46-4, TULSA, OK, 74102 | | #135 DAVID C PARKER DLC 4.17A | GAS STORAGE TANKS, PUMPING, DISTRIBUTION, PIPELINE | MF-24 | 6-Month |
| 73134007 | NORTHWEST PIPELINE | PO BOX 2400 MD 46-4, TULSA, OK, 74102 | 30 C ST, WASHOUGAL, 98671 | #7 DAVID PARKER DLC .45A | GAS STORAGE TANKS, PUMPING, DISTRIBUTION, PIPELINE | CH | 6-Month |
| 73139089 | PORT OF CAMAS WASHOUGAL | 24 S A ST, WASHOUGAL, WA, 98671 | | PARKERSVILLE LOT 10 BLK 10 | PARKING LOT: GRAVEL, FOR ADJOINING BUILDING | CH | 6-Month |

**Table 2. Summary Data for Parcels of Concern Within Camas Wellhead Protection Capture Zone**

| Parcel Serial Number | Owner Name | Owner Address | Site Address | Legal Description | Land-Use Description | Zoning | WHPZ |
|---|---|---|---|---|---|---|---|
| 73139080 | PORT OF CAMAS WASHOUGAL | 24 S A ST, WASHOUGAL, WA, 98671 | 115 S 1ST ST, WASHOUGAL, 98671 | PARKERSVILLE LOTS 1, 2, 3, 4, 5 BLK 10 | BOATS AND MARINE ACCESSORIES. | CH | 6-Month |
| 73139087 | PORT OF CAMAS WASHOUGAL | 24 S A ST, WASHOUGAL, WA, 98671 | | PARKERSVILLE LOTS 8 & 9 BLK 10 | PARKING LOT: GRAVEL, FOR ADJOINING BUILDING | CH | 6-Month |
| 73134170 | PORT OF CAMAS WASHOUGAL | 24 S A ST, WASHOUGAL, WA, 98671 | | #170 DAVID C PARKER DLC | ELECTRIC POWER OPERATING, MAINT., AND REPAIR BUILD | CH | 6-Month |
| 73134161 | PORT OF CAMAS WASHOUGAL | 24 S A ST, WASHOUGAL, WA, 98671 | 40 S MARINA WAY, WASHOUGAL, 98671 | #161 DAVID C PARKER DLC 2.05A | MOTOR VEHICLE DEALERS, NEW CARS AND SMALL TRUCKS, | CH | 6-Month |
| 986035425 | PORT OF CAMAS WASHOUGAL | 24 S A ST, WASHOUGAL, WA, 98671 | | #224 PARKERSVILLE BLK 13 .51A | PARKING LOT: GRAVEL, FOR ADJOINING BUILDING | CH | 6-Month |
| 73139085 | PORT OF CAMAS WASHOUGAL | 24 S A ST, WASHOUGAL, WA, 98671 | | PARKERSVILLE LOTS 6 & 7 BLK 10 | PARKING LOT: GRAVEL, FOR ADJOINING BUILDING | CH | 6-Month |
| 73139090 | PORT OF CAMAS WASHOUGAL | 24 S A ST, WASHOUGAL, WA, 98671 | | #223 PARKERSVILLE BLK 13 .84 | PARKING LOT: GRAVEL, FOR ADJOINING BUILDING | CH | 6-Month |
| 73134157 | PORT OF CAMAS WASHOUGAL | 24 S A ST, WASHOUGAL, WA, 98671 | | #157 DAVID PARKER DLC .92A | PARKING LOT: GRAVEL, FOR ADJOINING BUILDING | CH | 6-Month |
| 88630000 | SAUER DEVELOPMENT GROUP LLC | 26300 NE 16TH ST, CAMAS, WA, 98607 | 754 SE UNION ST, CAMAS, 98607 | OAK PARK ADDN WASHOUGAL LOT 6 BLK 8 | MFG - MACHINERY | HI | 6-Month |
| 87053000 | SAUER DEVELOPMENT GROUP LLC | 26300 NE 16TH ST, CAMAS, WA, 98607 | | ORCHARD HOME WASHOUGAL #4 LOT 2 1.91A | MFG - MACHINERY | HI | 6-Month |
| 88640000 | SAUER DEVELOPMENT GROUP LLC | 26300 NE 16TH ST, CAMAS, WA, 98607 | 2205 SE 8TH AVE, CAMAS, 98607 | OAK PARK ADDN WASHOUGAL LOTS 7 & 8 BLK 8 | MFG - MACHINERY | HI | 6-Month |
| 87054000 | SAUER DEVELOPMENT GROUP LLC | 26300 NE 16TH ST, CAMAS, WA, 98607 | | ORCHARD HOME WASHOUGAL #5 LOT 2 .23A | MFG - MACHINERY | HI | 6-Month |
| 91045167 | SONDEREN ENTERPRISES LLC | 6590 SW LOMBARD AVE, BEAVERTON, OR, 97008 | 3136 NE 3RD AVE, CAMAS, 98607 | #176-A DAVID C PARKER DLC 2.13A | TIRE, BATTERIES, PARTS AND ACCESSORIES DEALERS | RC | 6-Month |
| 73134116 | D3RW LLC | 455 C ST, WASHOUGAL, WA, 98671 | 453 C ST, WASHOUGAL, 98671 | #116 DAVID C PARKER DLC 1.11A | PARKING LOT: GRAVEL, FOR ADJOINING BUILDING | CH | 1-Year |
| 91045666 | FOUNTAIN ROBERT & FOUNTAIN NANCY | 114 SE WEIR ST, CAMAS, WA, 98607 | 114 NE WEIR ST, CAMAS, 98607 | WEIR PARK LOT 16 BLK 5 | GENERAL REPAIR & SERVICE GARAGES | RC | 1-Year |
| 91045584 | KITTERMAN LLC 45.6% | 811 NE 112TH AVE STE 104, VANCOUVER, WA, 98684 | | WEIR PARK #1 LOT 8 BLK 1 | PARKING LOT: GRAVEL, FOR ADJOINING BUILDING | RC | 1-Year |
| 91045582 | KITTERMAN LLC 45.6% | 811 NE 112TH AVE STE 104, VANCOUVER, WA, 98684 | | WEIR PARK #1 LOT 7 BLK 1 | PARKING LOT: GRAVEL, FOR ADJOINING BUILDING | RC | 1-Year |

**Table 2. Summary Data for Parcels of Concern Within Camas Wellhead Protection Capture Zone**

| Parcel Serial Number | Owner Name | Owner Address | Site Address | Legal Description | Land-Use Description | Zoning | WHPZ |
|---|---|---|---|---|---|---|---|
| 75357049 | M & M CARWASH INC | PO BOX 832, BORING, OR, 97009 | | R B JOHNSTON TT LOT 12 BLK 2 (SEE 075357-048-050 LAND AV) | DRIVE THROUGH CAR WASH | CV | 1-Year |
| 75357050 | M & M CARWASH INC | PO BOX 832, BORING, OR, 97009 | 469 E ST, WASHOUGAL, 98671 | R B JOHNSTON TRACTS LOT 13 BLK 2 | DRIVE THROUGH CAR WASH | CV | 1-Year |
| 75357051 | M & M CARWASH INC | PO BOX 832, BORING, OR, 97009 | | R B JOHNSTON TRACTS LOT 14 BLK 2 | DRIVE THROUGH CAR WASH | CV | 1-Year |
| 75357048 | M & M CARWASH INC | PO BOX 832, BORING, OR, 97009 | 469 E ST, WASHOUGAL, 98671 | R B JOHNSTON TTS LOT 12 BLK 2 | DRIVE THROUGH CAR WASH | CV | 1-Year |
| 73134155 | MCGREW ROBERT W & MCGREW KATHARINA TRUSTEES | 40220 SE GIBSON RD, WASHOUGAL, WA, 98671 | 450 C ST, WASHOUGAL, 98671 | #155 DAVID C PARKER DLC .38A | SERVICE REPAIR SHOP | CH | 1-Year |
| 71355005 | TOWNSEND GREG & TOWNSEND MONICA | 401 6TH ST, WASHOUGAL, WA, 98671 | 401 6TH ST, WASHOUGAL, 98671 | LOT 2 SP2-554 1.04A | VETERINARIANS / SMALL ANIMAL HOSPITALS. | CH | 1-Year |
| 91045652 | TRUBCO LLC | PO BOX 06116, CHICAGO, IL, 60606 | 3440 NE 3RD AVE, CAMAS, 98607 | WEIR PARK LOTS 3 & 4 BLK 5 | TIRE, BATTERIES, PARTS AND ACCESSORIES DEALERS | RC | 1-Year |
| 71542000 | BKS ENTERPRISES INC | 1641 E ST, WASHOUGAL, WA, 98671 | 1641 E ST, WASHOUGAL, 98671 | #292 OF RICHARD OUGH DLC | DRIVE THROUGH CAR WASH | CC | 5-Year |
| 131901042 | CITY OF WASHOUGAL | 1701 C ST, WASHOUGAL, WA, 98671 | | AUTUMN SLOPE TT A SUB 2004 | BIO-FILTRATION SWALES/PONDS | R1-10 | 5-Year |
| 71683000 | COLUMBIA ELECTRIC INC | PO BOX 900, WASHOUGAL, WA, 98671 | 1338 E ST, WASHOUGAL, 98671 | #496 OF RICHARD OUGH DLC .21A | SERVICE REPAIR SHOP | CC | 5-Year |
| 71792000 | HATTEN RANDALL & HATTEN BRENDA | 403 45TH CT, WASHOUGAL, WA, 98671 | 1320 E ST, WASHOUGAL, 98671 | #662 OF RICHARD OUGH DLC .31A | SERVICE REPAIR SHOP | CC | 5-Year |
| 71360000 | HIGGINSON BLAINE & HIGGINSON BRIAN | 984 WASHOUGAL RIVER RD, WASHOUGAL, WA, 98671 | 984 WASHOUGAL RIVER RD, WASHOUGAL, 98671 | #19C OF RICHARD OUGH DLC .50A | SERVICE REPAIR SHOP | R1-10 | 5-Year |
| 71886000 | JENSEN RONALD & JENSEN DONNA TRUSTEE | 1076 N SHEPHERD RD, WASHOUGAL, WA, 98671 | 1022 E ST, WASHOUGAL, 98671 | #777 RICHARD OUGH DLC | SERVICE REPAIR SHOP | CC | 5-Year |
| 71717002 | MAHRE DONALD A (C/S) | 1403 SE 283RD AVE, CAMAS, WA, 98607 | 1315 E ST, WASHOUGAL, 98671 | #553 OF RICHARD OUGH DLC .14A | SERVICE REPAIR SHOP | CC | 5-Year |
| 71592000 | MALFAIT RONALD & MALFAIT SHERYL | 31914 SE 17TH ST, WASHOUGAL, WA, 98671 | | #367 OF RICHARD OUGH DLC | DRIVE THROUGH CAR WASH | CC | 5-Year |
| 71666000 | MALFAIT RONALD & MALFAIT SHERYL | 31914 SE 17TH ST, WASHOUGAL, WA, 98671 | 1138 E ST, WASHOUGAL, 98671 | #473 OF RICHARD OUGH DLC | GENERAL REPAIR & SERVICE GARAGES | CC | 5-Year |
| 71706000 | MALFAIT RONALD & MALFAIT SHERYL | 31914 SE 17TH ST, WASHOUGAL, WA, 98671 | 1204 E ST, WASHOUGAL, 98671 | #530 OF RICHARD OUGH DLC .25A | TIRE, BATTERIES, PARTS AND ACCESSORIES DEALERS | CC | 5-Year |

**Table 2. Summary Data for Parcels of Concern Within Camas Wellhead Protection Capture Zone**

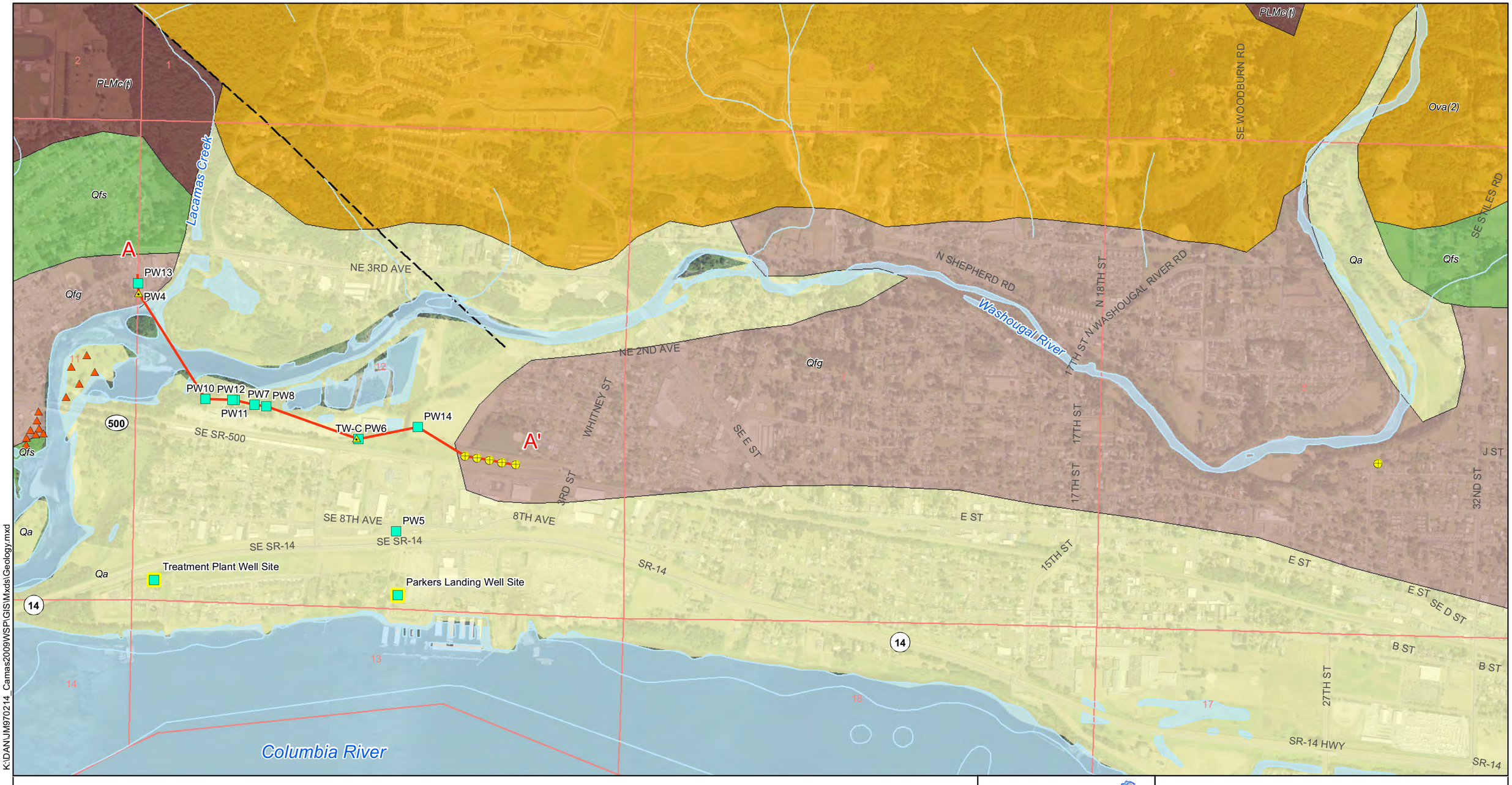
| Parcel Serial Number | Owner Name | Owner Address | Site Address | Legal Description | Land-Use Description | Zoning | WHPZ |
|---|---|---|---|---|---|---|---|
| 71559000 | MALFAIT RONALD & MALFAIT SHERYL | 31914 SE 17TH ST, WASHOUGAL, WA, 98671 | 1022 E ST, WASHOUGAL, 98671 | #315 OF RICHARD OUGH DLC | DRIVE THROUGH CAR WASH | CC | 5-Year |
| 71680000 | MALFAIT RONALD S | 31914 SE 17TH ST, WASHOUGAL, WA, 98671 | 1250 E ST, WASHOUGAL, 98671 | #489 OF RICHARD OUGH DLC .22A | SERV STATION W/ TANKS & PUMPS OR CARD LOCK STATION | CC | 5-Year |
| 75359586 | RADFORD BRIAN J | 3000 H ST, WASHOUGAL, WA, 98671 | 730 E ST, WASHOUGAL, 98671 | MIDLAND ACRE REPLT BLKS 1-5 & TTA #2 LTS 24 Z 26 BLK 1 | GENERAL REPAIR & SERVICE GARAGES | CC | 5-Year |
| 71741000 | REHR RYAN N | 1005 I STREET, WASHOUGAL, WA, 98671 | 1005 I ST, WASHOUGAL, 98671 | #589 OF RICHARD OUGH DLC .35A | FEEDLOTS. | R1-7.5 | 5-Year |
| 71528000 | SHETLAND COMMERCIAL PROPERTY LLC | PO BOX 31, WASHOUGAL, WA, 98671 | 1434 E ST, WASHOUGAL, 98671 | #276 OF RICHARD OUGH DLC | GENERAL REPAIR & SERVICE GARAGES | CC | 5-Year |
| 71910000 | SHETLAND COMMERCIAL PROPERTY LLC | PO BOX 31, WASHOUGAL, WA, 98671 | | #803 RICHARD OUGH DLC | GENERAL REPAIR & SERVICE GARAGES | CC | 5-Year |
| 71527002 | SHETLAND COMMERCIAL PROPERTY LLC | PO BOX 31, WASHOUGAL, WA, 98671 | | #275 OF RICHARD OUGH DLC | GENERAL REPAIR & SERVICE GARAGES | CC | 5-Year |
| 71832000 | VAUGHN PATRICIA | 4155 NE THREE MILE LN UNIT 142, MCMINNVILLE, OR, 97128 | 1405 E ST, WASHOUGAL, 98671 | #714 RICHARD OUGH DLC .23A | GENERAL REPAIR & SERVICE GARAGES | CC | 5-Year |
| 71678002 | VAUGHN PATRICIA | 4155 NE THREE MILE LN UNIT 142, MCMINNVILLE, OR, 97128 | 1351 E ST, WASHOUGAL, 98671 | #487 OF RICHARD OUGH DLC .23A | MOTOR VEHICLE DEALERS, USED CARS AND SMALL TRUCKS. | CC | 5-Year |
| 71543000 | VAUGHN PATRICIA | 4155 NE THREE MILE LN UNIT 142, MCMINNVILLE, OR, 97128 | 1423 E ST, WASHOUGAL, 98671 | #293 OF RICHARD OUGH DLC | SERVICE REPAIR SHOP | CC | 5-Year |
| 75359644 | WASHOUGAL SCHOOL DIST #112 | 2349 B ST, WASHOUGAL, WA, 98671 | 995 E ST, WASHOUGAL, 98671 | MIDLAND ACRES REPLAT BLKS 1-5 & TT A #1 LOT 2 BLK A | FLEET OPERATION CENTERS & STORAGE | CC | 5-Year |
| 71622000 | WASHOUGAL SCHOOL DIST #112 | 2349 B ST, WASHOUGAL, WA, 98671 | | #420 OF RICHARD OUGH DLC | FLEET OPERATION CENTERS & STORAGE | CC | 5-Year |
| 75359646 | WASHOUGAL SCHOOL DIST #112 | 2349 B ST, WASHOUGAL, WA, 98671 | | MIDLAND ACRE REPLAT BLKS 1-5 & TT A #2 LOT 2 BLK A | FLEET OPERATION CENTERS & STORAGE | CC | 5-Year |
| 75358010 | WASHOUGAL SCHOOL DIST #112 | 2349 B ST, WASHOUGAL, WA, 98671 | 971 E ST, WASHOUGAL, 98671 | ELLS SUB-DIV LOT 1 | FLEET OPERATION CENTERS & STORAGE | CC | 5-Year |
| 89924000 | CITY OF CAMAS | 616 NE 4TH AVE, CAMAS, WA, 98607 | | #183A DAVID C PARKER DLC 1 A M/L | SEWAGE RELATED BLDG OR STRUCTURE | RC | CARA |
| 87124000 | CITY OF CAMAS | 616 NE 4TH AVE, CAMAS, WA, 98607 | | ORCHARD HOME WASHOUGAL G,H,& I LOT 4 .17A | SEWAGE RELATED BLDG OR STRUCTURE | LI | CARA |

Table 3. Summary of Environmental Sites of Potential Concern within Wellhead Protection Capture Zones

| Map ID (See Fig.5) | Facility Name | Facility ID | WHPZ | Release | Underground Storage Tank | Leaking Underground Storage Tank | Total "Current" Operational Tank Volume (gallons) | Hazardous Materials | Cleanup Site | Cleanup Status[1] | Nature of Contaminants at Cleanup Sites[2]: Halogenated Organic Compounds | EPA Priority Pollutant Metals | PCB | Petroleum Products - Unspecified | Petroleum - Gasoline | Petroleum-Diesel | Benzene | Phenolic Compounds | Non Halogenated Solvents | PAH | Arsenic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Camas City Well 11 & 12 | 994431 | 6-Month | | | | | Y | | | | | | | | | | | | | |
| 2 | Camas City Well 3 | 9810684 | 6-Month | | | | | Y | | | | | | | | | | | | | |
| 3 | Camas City Well 4 | 81347684 | 6-Month | | | | | Y | | | | | | | | | | | | | |
| 4 | Camas Washougal Port | 92847997 | 6-Month | Y | Y | Y | 16,000 | | Y | NFA | | | | | RB (s) | | B (s) | | B (s) | | |
| 5 | Chevron Bulk Plant Camas | 1043 | 6-Month | Y | | | | | Y | Cleanup Started | C (gw) | C (s) | | C (gw) C (s) | | | | | C (gw) C (s) | | |
| 6 | Clark Public Utility Dist C St | 5352681 | 6-Month | | Y | | Removed 1996 | | | | | | | | | | | | | | |
| 7 | Columbia Rock Concrete Products Inc | 5016308 | 6-Month | Y | | | | | Y | Awaiting Cleanup | | C (gw) S (s) | | S (gw) C (s) | | | | | | | |
| 8 | Columbia Storage Inc 2nd St | 11338232 | 6-Month | | | | | Y | | | | | | | | | | | | | |
| 9 | Columbia Warehouse | 37125488 | 6-Month | | Y | | Removed or Closed in Place 1996 | Y | | | | | | | | | | | | | |
| 10 | Concrete Products Of Oregon LLC | 70983458 | 6-Month | | Y | | Removed 1996 | Y | | | | | | | | | | | | | |
| 11 | Hambleton Bros Log Yard | 4399598 | 6-Month | Y | | | | | Y | NFA | | B (gw) RB (sw) RA (s) | RA (s) | RB (sw) RA (s) | | RA (gw) RA (s) | | RB (sw) | | RB (sw) RA (s) | |
| 12 | Hambleton Bros Lumber Co Inc | 87338713 | 6-Month | | Y | | Removed 1996 | | | | | | | | | | | | | | |
| 13 | Jimbos Deli Mart 2 | 86429735 | 6-Month | | Y | | 35,000 | | | | | | | | | | | | | | |
| 14 | Northwest Pipeline Gp Washougal M/S | 14447751 | 6-Month | Y | | | | Y | Y | NFA | | RB (s) | | | | | | | | | B (s) |
| 15 | Philpot | 12088 | 6-Month | | Y | | 500 - Closing 500 - Exempt | | | | | | | | | | | | | | |
| 16 | Tarr Inc Washougal | 3264254 | 6-Month | | | | | Y | | | | | | | | | | | | | |
| 17 | Tidland Corp | 88277363 | 6-Month | | | | | Y | | | | | | | | | | | | | |
| 18 | Tidland Corporation | 7282918 | 6-Month | | Y | | Removed 1996 | | | | | | | | | | | | | | |
| 19 | Triangle Resources | 3153967 | 6-Month | | | | | | | | | | | | | | | | | | |
| 20 | Us Doe Bpa Camas Substation | 3811629 | 6-Month | | | | | Y | | | | | | | | | | | | | |
| 21 | All Seasons Auto Centers Inc Camas | 18768638 | 1-Year | | | | | Y | | | | | | | | | | | | | |
| 22 | Brass Lamp Motor Inn | 64124152 | 1-Year | | | | | Y | | | | | | | | | | | | | |
| 23 | Goodyear Tire Camas | 85837922 | 1-Year | Y | Y | Y | Removed 1999 & 2001 | | Y | NFA | R (soil) | | | C (s) | | | | | | | |
| 24 | Helland Brothers SS | 69936158 | 1-Year | | | | | Y | | | | | | | | | | | | | |
| 25 | Schucks Auto Supply Camus | 52218486 | 1-Year | | | | | Y | | | | | | | | | | | | | |
| 26 | Washougal Electric & Sheet Metal Inc | 16327542 | 1-Year | | Y | | Removed 1996 | | | | | | | | | | | | | | |
| 27 | Asher Engine Service | 94778244 | 5-Year | | | | | Y | | | | | | | | | | | | | |
| 28 | Clark County Pub Wks Washougal Site | 95756539 | 5-Year | | Y | | Removed 1996 | | | | | | | | | | | | | | |
| 29 | Hi Way Fuel | 22538744 | 5-Year | Y | Y | Y | 56,000 | | Y | Cleanup Started | | | | C (gw) C (s) | | | | | | | |
| 30 | Napa Washougal | 79581825 | 5-Year | | | | | Y | | | | | | | | | | | | | |
| 31 | Overton Mfg Inc | 49392144 | 5-Year | | | | | Y | | | | | | | | | | | | | |
| 32 | Washougal School Dist Bus Garage | 48371594 | 5-Year | | Y | | Removed 1996 Unknown - Exempt | | | | | | | | | | | | | | |
| 33 | Washougal Shell | 57872946 | 5-Year | | Y | | Removed 1996 | | | | | | | | | | | | | | |
| 34 | Camas City Operations Center | 38772238 | CARA | | | | | Y | | | | | | | | | | | | | |
| 35 | Camas STP | 74959167 | CARA | | | | | Y | | | | | | | | | | | | | |
| 36 | Gk Construction & Equipment Rentals | 4168647 | CARA | | | | | Y | | | | | | | | | | | | | |

1. NFA = No Further Action
2. Nature of Contaminants and Impacted Media at Cleanup Sites (as provided on Ecology's online Site Summary Report).

| | | | | | |
|---|---|---|---|---|---|
| B | Below Cleanup Level | R | Remediated | (gw) | Groundwater |
| C | Confirmed Above Cleanup Level | RA | Remediated-Above Cleanup Level | (sw) | Surface Water |
| S | Suspected | RB | Remediated-Below Cleanup Level | (s) | Soil |

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Camas Supply Well
Camas Proposed Supply Well
Washougal Supply Well
Georga Pacific Supply Well
Cross Section Alignment
Other Well in Cross Section

Geologic Units (DGER 100K)

- Qfs - outburst flood deposits, sand and silt, late Wisconsinan
- Qa - alluvium
- Qfg - outburst flood deposits, gravel
- Ova(2) - Andesite flows
- PLM(t) - continental sedimentary deposits or rocks (Troutdale Formation)
- Normal Fault

0 Feet 1,000

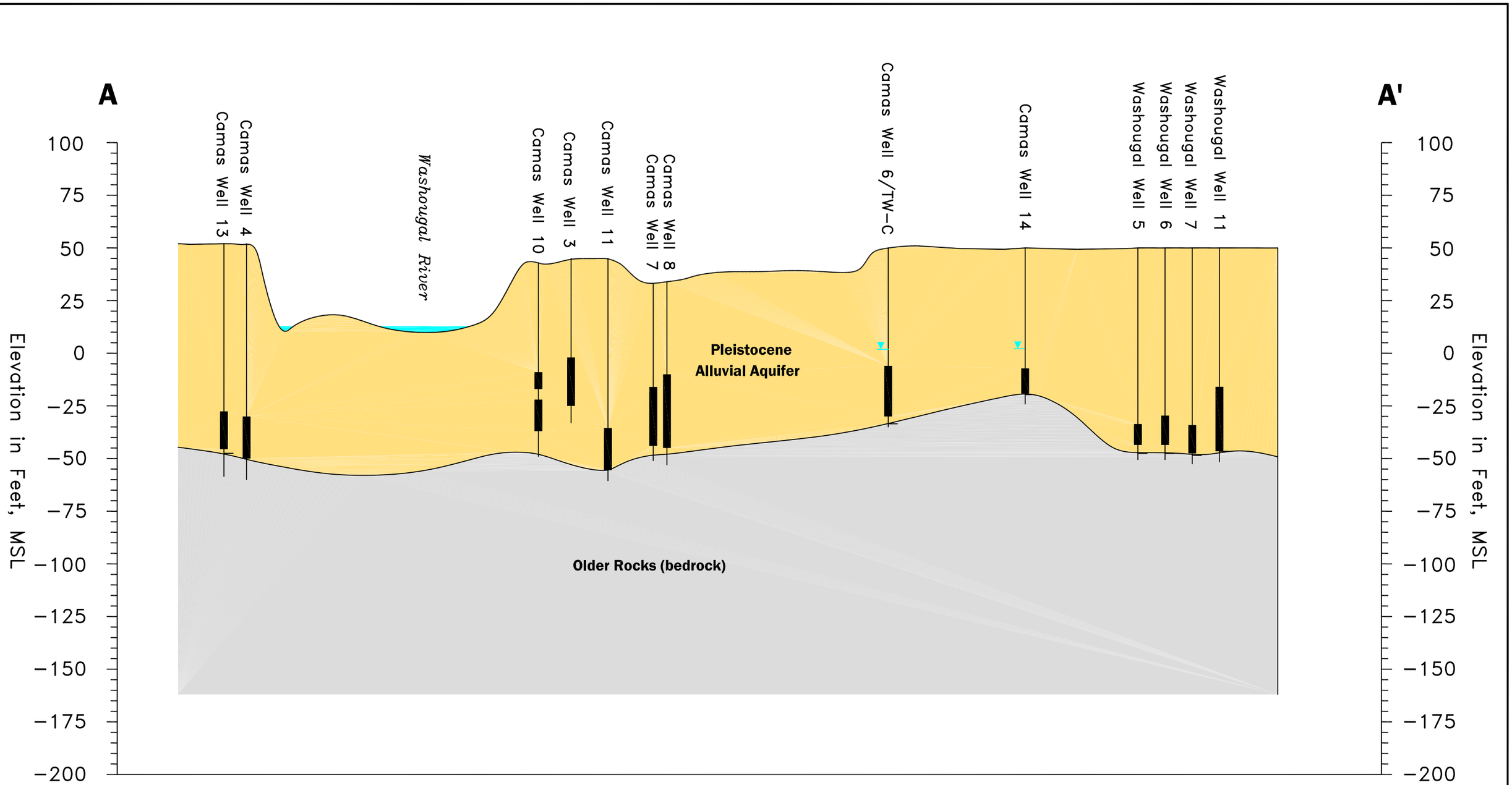
N

2007 Aerial Photo from Clark County


# Figure 1
## Surficial Geology, Cross Section & Wellfields

Camas Wellhead Protection Plan

PgG




**LEGEND**

- Well Water Level
- Well Completion Interval

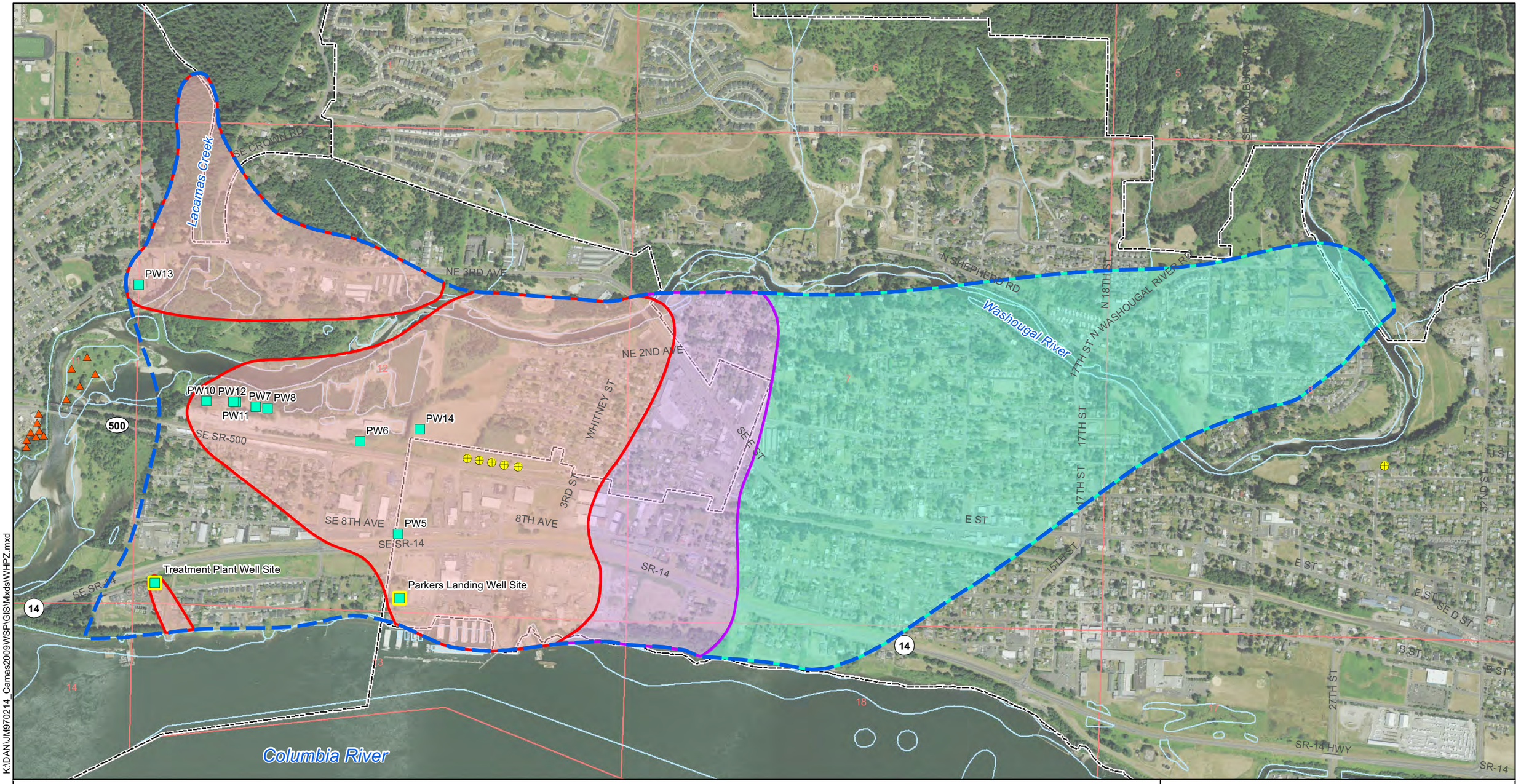
Horizontal Scale in Feet
0 250 500
0 25 50
Vertical Scale in Feet

**FIGURE 2**
**Hydrogeologic Cross Section A-A'**

City of Camas
Replacement Wells

JM9702.06, XSECA.DWG, May/2003

PgG

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- Camas Supply Well
- Camas Proposed Supply Well
- Washougal Supply Well
- Georga Pacific Supply Well

Wellhead Protection Capture Zones (WHPP-3 Scenario)

- 6 Month Capture Zone
- 1 Year Capture Zone
- 5 Year Capture Zone

- Critical Aquifer Recharge Area (CARA)
- City Limits

0 Feet 1,000

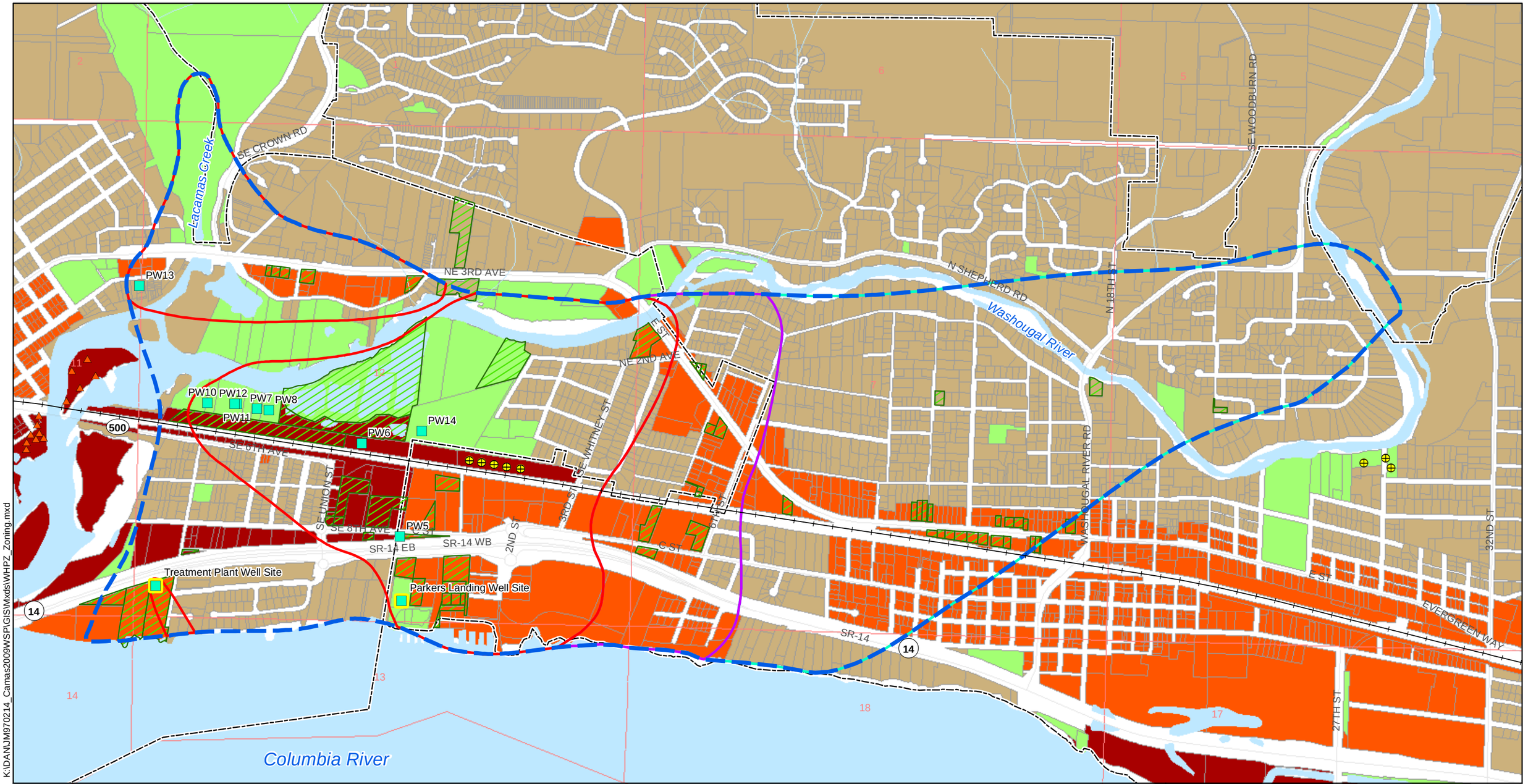
N

2007 Aerial Photo from Clark County

# Figure 3
## City of Camas Wellhead Protection Capture Zones

Camas Wellhead Protection Plan

PgG




K:\DANUM970214_Camas2009WSP\GIS\Mxds\WHPZ_Zoning.mxd

- Camas Supply Well
- Camas Proposed Supply Well
- Washougal Supply Well
- Georga Pacific Supply Well
- BNSF Railroad
- City Limits

**Parcels by Zoning Categories**

- Industrial
- Commercial
- Residential
- Parks
- Parcels of Concern

- Critical Aquifer Recharge Area (CARA)
- 6 Month Capture Zone
- 1 Year Capture Zone
- 5 Year Capture Zone

0 Feet 1,000

N

Figure 4

Zoning Categories and Parcels of Concern

Camas Wellhead Protection Plan

PgG

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## DOE Sites of Concern

Known Release

Table 3 ID → 11 ← Cleanup Site

UST/LUST

Hazardous Materials

Refer to Section 4.3 and Table 3 for description.

## Other Sites of Concern

- Drywells (from County)
- Septic Systems (from County)
- WSDOT Infiltration Area
- Railroad Crossing (Private)
- Railroad Crossing (Public)
- BNSF Railroad

## Water Supply Wells

- Camas Supply Well
- Camas Proposed Supply Well
- Washougal Supply Well
- City Limits

## Camas Lower Washougal Wellfield Capture Areas

- Critical Aquifer Recharge Area (CARA)
- 6 Month Capture Zone
- 1 Year Capture Zone
- 5 Year Capture Zone

From PGG, 2009

0 Feet 1,000

N

# Figure 5

## Potential Contaminant Sources of Concern

Camas Wellhead Protection Plan

PGG

# APPENDIX A
# ENVIRONMENTAL SITES INFORMATION

Copies of Cleanup Site reports and documents reviewed for this report can be obtained from the Seattle office of Pacific Groundwater Group by contacting Dawn Chapel at 206-329-0141 Ext. 210

# APPENDIX B
# NOTIFICATION LETTERS

Table A-1: Environmental Site Mailing List for Wellhead Protection Area Notification

| Map ID | Facility /Site ID | Facility/Site Name | Address | City | State | Zip Code |
|---|---|---|---|---|---|---|
| 35 | 74959167 | CAMAS STP | 1129 SE POLK ST | CAMAS | WA | 98607 |
| 29 | 22538744 | HI WAY FUEL | 1250 E ST | WASHOUGAL | WA | 98671 |
| 13 | 86429735 | JIMBOS DELI MART 2 | 165 C ST | WASHOUGAL | WA | 98671 |
| 21 | 18768638 | All Seasons Auto Centers Inc Camas | 3440 NE 3RD AVE | CAMAS | WA | 98607 |
| 3 | 81347684 | CAMAS CITY WELL 4 | E 1ST AVE & CRAMER LN | CAMAS | WA | 98607 |
| 30 | 79581825 | Napa Washougal | 1414 E ST | WASHOUGAL | WA | 98671 |
| 5 | 1043 | CHEVRON BULK PLANT CAMAS | SE 6TH AVE & SE UNION AVE | CAMAS | WA | 98607 |
| 14 | 14447751 | Northwest Pipeline GP Washougal M/S | 30 C ST | WASHOUGAL | WA | 98671-2143 |
| 24 | 69936158 | Helland Brothers SS | 135 6TH ST | CAMAS | WA | 98607 |
| 22 | 64124152 | Brass Lamp Motor Inn | 544 6TH ST | WASHOUGAL | WA | 98671 |
| 20 | 3811629 | US DOE BPA Camas Substation | 1ST ST 1 BLK N OF 8TH AVE | WASHOUGAL | WA | 98671 |
| 31 | 49392144 | Overton Mfg Inc | 1325 E ST | WASHOUGAL | WA | 98671-1410 |
| 9 | 37125488 | COLUMBIA WAREHOUSE | 361 C ST | WASHOUGAL | WA | 98671 |
| 19 | 3153967 | TRIANGLE RESOURCES | 612 SE UNION ST | CAMAS | WA | 98607 |
| 8 | 11338232 | COLUMBIA STORAGE INC 2ND ST | 365 2ND ST | WASHOUGAL | WA | 98671-2111 |
| 27 | 94778244 | Asher Engine Service | 1405 E ST | WASHOUGAL | WA | 98671 |
| 10 | 70983458 | CONCRETE PRODUCTS OF OREGON LLC | 1615 SE 6TH AVE | CAMAS | WA | 98607 |
| 34 | 38772238 | Camas City Operations Center | 1620 SE 8TH AVE | CAMAS | WA | 98607 |
| 17 | 88277363 | Tidland Corp | 2305 SE 8TH AVE | CAMAS | WA | 98607 |
| 26 | 16327542 | WASHOUGAL ELECTRIC & SHEET METAL INC | 594 C ST | WASHOUGAL | WA | 98671-0005 |
| 6 | 5352681 | CLARK PUBLIC UTILITY DIST C ST | 89 C ST | WASHOUGAL | WA | 98671-2142 |
| 18 | 7282918 | TIDLAND CORPORATION | 2363 8TH AVE SE | CAMAS | WA | 98607-2261 |
| 33 | 57872946 | WASHOUGAL SHELL | 730 E ST | WASHOUGAL | WA | 98671 |
| 12 | 87338713 | HAMBLETON BROS LUMBER CO INC | S12 T1N R3E WILLAMETTE MERIDIAN | WASHOUGAL | WA | 98671 |
| 28 | 95756539 | CLARK COUNTY PUB WKS WASHOUGAL SITE | 4624 SE WASHOUGAL | WASHOUGAL | WA | 98671-9262 |
| 23 | 85837922 | GOODYEAR TIRE CAMAS | 3440 3RD AVE | CAMAS | WA | 98607 |
| 25 | 52218486 | Schucks Auto Supply Camus | 3440 NE 3RD ST | CAMAS | WA | 98607 |
| 7 | 5016308 | COLUMBIA ROCK CONCRETE PRODUCTS INC | 1615 SE 6TH AVE | CAMAS | WA | 98607 |
| 16 | 3264254 | TARR INC WASHOUGAL | 361B C ST | WASHOUGAL | WA | 98671 |
| 2 | 9810684 | CAMAS CITY WELL 3 | SE 6TH AVE & POLK ST N SIDE OF RR TRACKS | CAMAS | WA | 98607 |
| 1 | 994431 | CAMAS CITY WELL 11 & 12 | SE 6TH AVE & POLK ST N SIDE OF RR TRACKS | CAMAS | WA | 98607 |
| 36 | 4168647 | GK Construction & Equipment Rentals | 1840 SE 8TH AVE | CAMAS | WA | 98607 |
| 4 | 92847997 | CAMAS WASHOUGAL PORT | 24 A ST | WASHOUGAL | WA | 98671-2163 |
| 11 | 4399598 | HAMBLETON BROS LOG YARD | 335 S A ST | WASHOUGAL | WA | 98671-2138 |
| 32 | 48371594 | WASHOUGAL SCHOOL DIST BUS GARAGE | 995 E ST | WASHOUGAL | WA | 98671-1317 |
| 15 | 12088 | Philpot | 3061 NE 2ND AVE | CAMAS | WA | 98607 |

DATE

Address of local business or cleanup site (see Table 2 and Table A-1)

Re: City of Camas Wellhead Protection Plan

To Whom It May Concern:

The City of Camas has developed an updated Wellhead Protection Plan to help maintain drinking water quality for our city residents. The Plan is based on Washington Department of Health WAC 246-290-135(3) regulations. As part of the Plan, maps were prepared that show the areas around each city drinking water well where a chemical spill on the ground may cause contamination of the well/aquifer. These areas are Wellhead Protection Areas (WHPA). The Plan also requires an inventory of potential sources of groundwater contamination within these wellhead protection areas.

The primary purpose of this letter is to notify you that your facility is located within our WHPA. Since your business or the activities conducted at your facility may involve the use of chemicals (e.g., gasoline, underground storage tanks, hazardous waste, etc.), and the potential exists that a chemical spill from your facility may adversely impact the city drinking water supply, please notify the City of Camas immediately if a chemical spill occurs at your facility. All spills should be reported by dialing 911 and requesting that the City of Camas Fire Department and Clark County Health Department be contacted.

Please note that the groundwater aquifer that supplies City Camas' wells also supply the City of Washougal's wells. Therefore, immediate notification of City of Camas in the event of a spill also assists the City of Washougal by protecting the water supply for the entire community.

Thank you for assisting us in protecting our water supply and groundwater resources. If you have any questions, please contact me at (360) 817-7899.

Sincerely,

Steve Wall
Public Works Director
City of Camas

DATE

Nick Swinhart, Fire Chief
Camas-Washougal Fire Department
616 NE 4th Avenue
Camas, Washington 98607

Re: City of Camas Wellhead Protection Plan

Dear Chief Swinhart:

The City of Camas has developed an updated Wellhead Protection Plan to help maintain the drinking water quality for our city residents. The Plan is based on Washington Department of Health WAC 246-290-135(3) regulations. As part of the Plan, maps were prepared that show the areas around each city drinking water well where a chemical spill on the ground may cause contamination of the well/aquifer. These areas are Wellhead Protection Areas (WHPA).

As part of this Plan, the city must provide wellhead protection information to agencies responsible for incident/spill response procedures. It is important that you are aware of where potential contaminant releases could adversely impact the quality of our communities drinking water supply.

A map of the wellhead protection areas and adjacent transportation routes is enclosed for your review. An acknowledgement of receipt of this information or a response from your office as part of our wellhead protection plan documentation would be appreciated.

In the event of a spill or contaminant release, we would ask that you notify immediately us and the Department of Ecology, so that we can take appropriate measures to deal with the problem.

Thank you for your attention in this matter. If you have any questions or would like a copy of the wellhead protection plan, please contact me at (360) 817-7899.

Sincerely,

Steve Wall
Public Works Director
City of Camas

DATE

Mitch Lackey, Police Chief
City of Camas Police Department
2100 NE 3rd Avenue
Camas, Washington 98607

Re: City of Camas Wellhead Protection Plan

Dear Chief Lackey:

The City of Camas has developed an updated Wellhead Protection Plan to help maintain the drinking water quality for our city residents. The Plan is based on Washington Department of Health WAC 246-290-135(3) regulations. As part of the Plan, maps were prepared that show the areas around each city drinking water well where a chemical spill on the ground may cause contamination of the well/aquifer. These areas are Wellhead Protection Areas (WHPA).

As part of this Plan, the city must provide wellhead protection information to agencies responsible for incident/spill response procedures. It is important that you are aware of where potential contaminant releases could adversely impact the quality of our communities drinking water supply.

A map of the wellhead protection areas and adjacent transportation routes is enclosed for your review. An acknowledgement of receipt of this information or a response from your office as part of our wellhead protection plan documentation would be appreciated.

In the event of a spill or contaminant release, we would ask that you notify immediately us and the Department of Ecology, so that we can take appropriate measures to deal with the problem.

Thank you for your attention in this matter. If you have any questions or would like a copy of the wellhead protection plan, please contact me at (360) 817-7899.

Sincerely,

Steve Wall
Public Works Director
City of Camas

DATE

Ron Mitchell, Police Chief
Washougal Police Department
1320 “A” Street
Washougal, Washington 98671

Re: City of Camas Wellhead Protection Plan

Dear Chief Mitchell:

The City of Camas has developed an updated Wellhead Protection Plan to help maintain the drinking water quality for our city residents. The Plan is based on Washington Department of Health WAC 246-290-135(3) regulations. As part of the Plan, maps were prepared that show the areas around each city drinking water well where a chemical spill on the ground may cause contamination of the well/aquifer. These areas are Wellhead Protection Areas (WHPA).

As part of this Plan, the city must provide wellhead protection information to agencies responsible for incident/spill response procedures. It is important that you are aware of where potential contaminant releases could adversely impact the quality of our communities drinking water supply.

A map of the wellhead protection areas and adjacent transportation routes is enclosed for your review. An acknowledgement of receipt of this information or a response from your office as part of our wellhead protection plan documentation would be appreciated.

In the event of a spill or contaminant release, we would ask that you notify immediately us and the Department of Ecology, so that we can take appropriate measures to deal with the problem.

Thank you for your attention in this matter. If you have any questions or would like a copy of the wellhead protection plan, please contact me at (360) 817-7899.

Sincerely,

Steve Wall
Public Works Director
City of Camas

DATE

Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775

Re: City of Camas Wellhead Protection Plan

Dear Department of Ecology:

The City of Camas has developed a Wellhead Protection Plan to help maintain the drinking water quality for our city residents. The Plan is based on Washington Department of Health WAC 246-290-135(3) regulations. As part of the Plan, maps were prepared that show the areas around each city drinking water well where a chemical spill on the ground may cause contamination of the well/aquifer. These areas are Wellhead Protection Areas (WHPA).

The enclosed map depicts the WHPA boundary, source wells, and identified potential contaminant sources. Also enclosed is a table (Table A-1) providing the facility ID, name and location for each parcel of concern. Please review the map and use it as a reference when inspecting and permitting the storage, use, and disposal of hazardous material within our WHPA.

Please note that the City of Camas has sent notices to each of these properties informing them of their location within the WHPA boundary. The City has also sent similar letters to businesses with land uses that could potentially contaminate groundwater quality.

Thank you for your attention in this matter. If you have any questions or would like a copy of the wellhead protection plan, please contact me at (360) 817-7899.

Sincerely,

Steve Wall
Public Works Director
City of Camas

DATE

Patrick Brady
General Director Hazardous Materials Saftey
Burlington Northern Santa Fe Railway
2500 Lou Menk Drive
Fort Worth, TX 76131

Re: City of Camas, Washington Wellhead Protection Plan

Dear Mr. Brady:

The City of Camas has developed an updated Wellhead Protection Plan to help maintain the drinking water quality for our city residents. The Plan is based on Washington Department of Health WAC 246-290-135(3) regulations. As part of the Plan, maps were prepared that show the areas around each city drinking water well where a chemical spill on the ground may cause contamination of the well/aquifer. These areas are Wellhead Protection Areas (WHPA). The City operates 9 supply wells within the WHPA, pumping groundwater from a shallow aquifer with relatively high susceptibility to contamination from surface spills. It is important that you are aware of where potential contaminant releases could adversely impact the quality of our communities drinking water supply.

The primary purpose of this letter is to notify you that the BNSF railroad runs through the center of our WHPA. Since BNSF transports hazardous materials there is the potential that a railroad spill could adversely impact the city's drinking water supply.

In the event of a spill or contaminant release, please notify the City of Camas immediately. All spills should be reported by dialing 911 and requesting the City of Camas Fire Department and Clark County Public Health be contacted.

An acknowledgement of receipt of this information or a response from your office as part of our wellhead protection plan documentation would be appreciated.

Thank you for your attention in this matter. If you have any questions or would like a copy of the wellhead protection plan, please contact me at (360) 817-7899.

Sincerely,

Steve Wall
Public Works Director
City of Camas

# APPENDIX J – MODELING

**Table 6.3 Fire Flow Calibration Results**
**Water System Plan**
**City of Camas**

**Updated: 12/5/2016**

| Test | Test Location | Date/ Time | Hydrant Type | Hydrant ID | Field Measured Data[1] | | | Model Simulated Data | | Percent Difference | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Hydrant Flow (gpm) | Hydrant Pressure (psi) | | Hydrant Pressure (psi) | | | |
| | | | | | | Static | Residual | Static | Residual | Static | Residual |
| 1A | SE 15th St and | 9/19/2016 | Flowing | 0571 | 675 | | 58 | NA | 57 | -- | -- |
| Gregg | SE 271st Ave | 3:29 PM | Flowing | 0570 | 653 | | 57 | NA | 48 | NA | -16% |
| On | | | Pressure | 0572 | | | 76 | NA | 74 | NA | -3% |
| | 542 Zone | | Pressure | 0569 | | | 58 | NA | 52 | NA | -10% |
| 1B | SE 15th St and | 9/19/2016 | Flowing | 0571 | 631 | 55 | 53 | 55 | 55 | -- | -- |
| Crown | SE 271st Ave | 3:14 PM | Flowing | 0570 | 533 | 46 | 45 | 48 | 47 | 3.5% | 5% |
| On | | | Pressure | 0572 | | 65 | 63 | 68 | 68 | 4.9% | 8% |
| | 542 Zone | | Pressure | 0569 | | 48 | 46 | 51 | 52 | 6.3% | 13% |
| 1C | SE 15th St and | 9/19/2016 | Flowing | 0571 | 716 | | 64 | NA | 57 | -- | -- |
| Both | SE 271st Ave | 3:24 PM | Flowing | 0570 | 631 | | 57 | NA | 50 | NA | -12% |
| On | | | Pressure | 0572 | | | 80 | NA | 74 | NA | -8% |
| | 542 Zone | | Pressure | 0569 | | | 58 | NA | 54 | NA | -7% |
| 2 | NW Friberg-Strunk St | 9/19/2016 | Flowing | 0695 | 876 | 130 | 120 | 125 | 112 | -- | -- |
| | | 1:34 PM | Pressure | 0694 | | 136 | 125 | 123 | 117 | -9.6% | -6% |
| | 544 Zone | | Pressure | No ID | | 131 | 120 | 122 | 114 | -6.9% | -5% |
| 3 | NW Whitman St | 9/19/2016 | Flowing | 0302 | 631 | 60 | 55 | 67 | 61 | -- | -- |
| | 522 | 12:56 PM | Pressure | 0303 | | 68 | 62 | 77 | 72 | 13.2% | 16% |
| | 697 Zone | | Pressure | 0298 | | 80 | 74 | 89 | 83 | 11.3% | 12% |
| 4 | Norwood | 9/19/2016 | Flowing | 0359 | 716 | 71 | 65 | 71 | 62 | -- | -- |
| | | 11:50 AM | Pressure | 0358 | | 74 | 71 | 70 | 66 | -5.4% | -7% |
| | 852 Zone | | Pressure | 0361 | | 90 | 83 | 82 | 73 | -8.9% | -12% |
| 5 | Division | 9/19/2016 | Flowing | | 716 | 84 | 79 | 77 | 77 | -- | -- |
| | | | Flowing | | 773 | 85 | 85 | 82 | 82 | -- | -- |
| | | 11:15 AM | Pressure | | | 86 | 85 | 79 | 79 | -8.1% | -7% |
| | 455 Zone | | Pressure | | | 86 | 85 | 81 | 81 | -5.8% | -5% |
| 6 | E 1st Ave | 9/19/2016 | Flowing | No ID | 475 | 111 | 65 | 112 | 102 | -- | -- |
| | | 2:12 PM | Pressure | No ID | | 111 | 90 | 114 | 107 | 2.7% | 19% |
| | 343 Zone | | Pressure | No ID | | 110 | 86 | 110 | 103 | 0.0% | 20% |

Notes:

**Table 6.3 Fire Flow Calibration Results**
**Water System Plan**
**City of Camas**

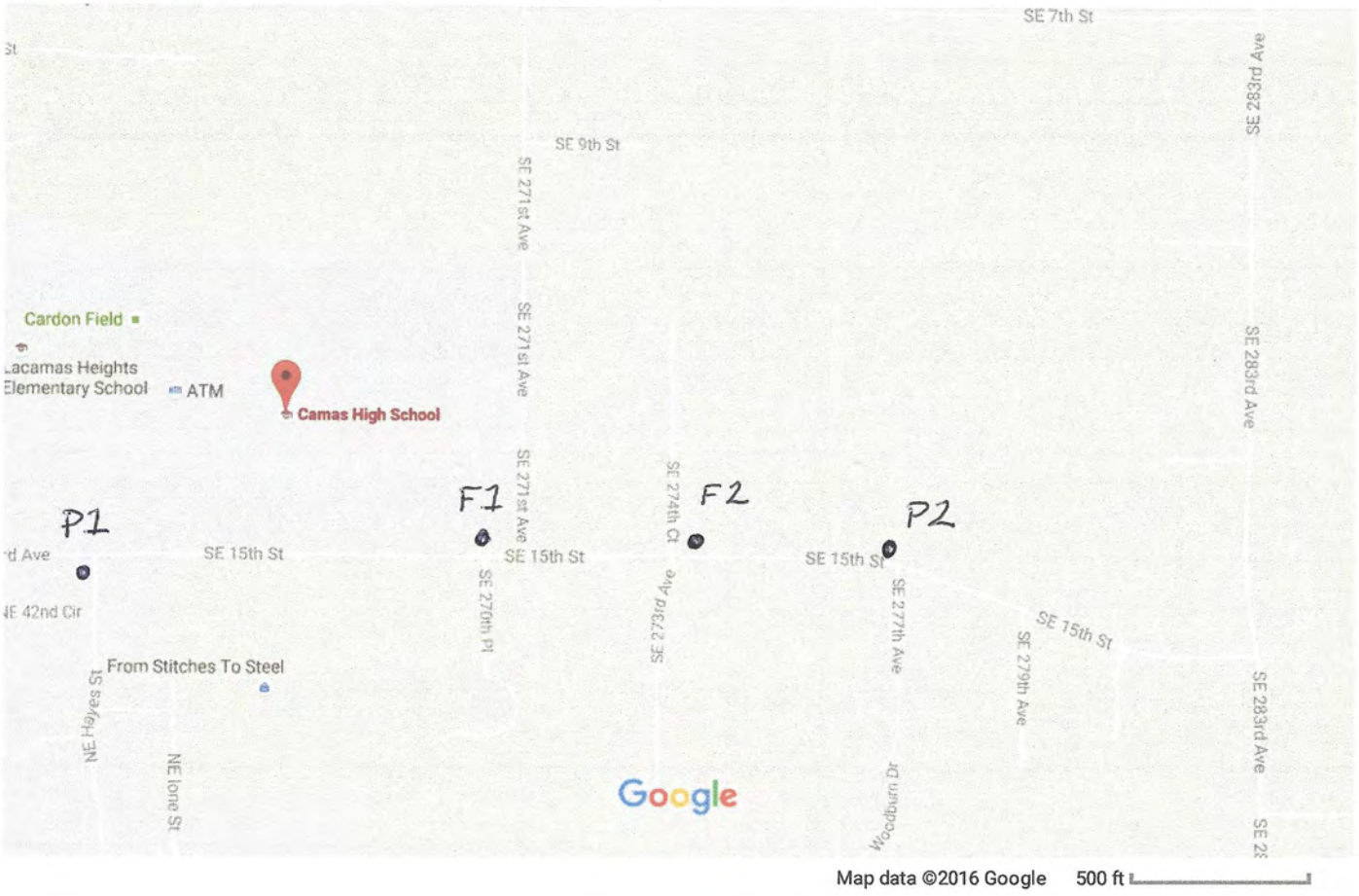
**Updated: 12/5/2016**

| Test | Test Location | Date/ Time | Hydrant Type | Hydrant ID | Pressure Drop Measured (psi) | Pressure Drop Modeled (psi) | Pressure Drop Difference |
|---|---|---|---|---|---|---|---|
| 1A | SE 15th St and | 9/19/2016 | Flowing | 0571 | -- | -- | -- |
| Gregg | SE 271st Ave | 3:29 PM | Flowing | 0570 | NA | NA | NA |
| On | | | Pressure | 0572 | NA | NA | NA |
| | 542 Zone | | Pressure | 0569 | NA | NA | NA |
| 1B | SE 15th St and | 9/19/2016 | Flowing | 0571 | -- | -- | -- |
| Crown | SE 271st Ave | 3:14 PM | Flowing | 0570 | 1 | 0.28 | -0.72 |
| On | | | Pressure | 0572 | 2 | 0.3 | -1.7 |
| | 542 Zone | | Pressure | 0569 | 2 | -1 | -3 |
| 1C | SE 15th St and | 9/19/2016 | Flowing | 0571 | -- | -- | -- |
| Both | SE 271st Ave | 3:24 PM | Flowing | 0570 | NA | NA | NA |
| On | | | Pressure | 0572 | NA | NA | NA |
| | 542 Zone | | Pressure | 0569 | NA | NA | NA |
| 2 | NW Friberg-Strunk St | 9/19/2016 | Flowing | 0695 | -- | -- | -- |
| | | 1:34 PM | Pressure | 0694 | 11 | 6 | -5 |
| | 544 Zone | | Pressure | No ID | 11 | 8 | -3 |
| 3 | NW Whitman St | 9/19/2016 | Flowing | 0302 | -- | -- | -- |
| | 522 | 12:56 PM | Pressure | 0303 | 6 | 5 | -1 |
| | 697 Zone | | Pressure | 0298 | 6 | 6 | 0 |
| 4 | Norwood | 9/19/2016 | Flowing | 0359 | -- | -- | -- |
| | | 11:50 AM | Pressure | 0358 | 3 | 4 | 1 |
| | 852 Zone | | Pressure | 0361 | 7 | 9 | 2 |
| 5 | Division | 9/19/2016 | Flowing | | -- | -- | -- |
| | | | Flowing | | -- | -- | -- |
| | | 11:15 AM | Pressure | | 1 | 0 | -1 |
| | 455 Zone | | Pressure | | 1 | 0 | -1 |
| 6 | E 1st Ave | 9/19/2016 | Flowing | No ID | -- | -- | -- |
| | | 2:12 PM | Pressure | No ID | 21 | 7 | -14 |
| | 343 Zone | | Pressure | No ID | 24 | 7 | -17 |

Notes:

# ATTACHMENT B – HYDRANT FLOW TEST FORMS

Google Maps Camas High School




**Legend**

- Pressure Hydrant
- Flowing Hydrant
- Back-up Hydrant
- Existing Water Main

GREGG ON

CROWN OFF

0 300 600 Feet

# HYDRANT FLOW TEST 1A FORM

CITY OF CAMAS
*MODEL VERIFICATION*

Date: 9/19/2016 Time: 3:29 PM Temperature: 67* F Pressure Zone: 542 Zone

Location:

**Flowing Hydrant 1 (F1)**
Hydrant #: 0571
Static PSI:
Residual PSI: 58
Flow GPM: 675
Duration: 3 MIN

**Pressure Hydrant 1 (P1)**
Hydrant #: 0572
Static PSI:
Residual PSI: 76

**Pressure Hydrant 2 (P2)**
Hydrant #: 0569
Static PSI:
Residual PSI: 58

**Flowing Hydrant 2 (F2)**
Hydrant #: 0570
Static PSI:
Residual PSI: 57
Flow GPM:
Duration: 3 MIN

Notes: SEE ATTACHED MAP

carollo

E:\KRC D DRIVE\CAMAS\Hydrant Maps\Maps\Hydrant Test 1A.mxd


Legend

- Pressure Hydrant
- Flowing Hydrant
- Back-up Hydrant
- Existing Water Main

CROWN ON

GREGG OFF

N

0 300 600 Feet

# HYDRANT FLOW TEST 1B FORM

CITY OF CAMAS
*MODEL VERIFICATION*

Date: 9/19/2016 Time: 3:14 PM Temperature: 67* F Pressure Zone: 542 Zone

Location:

| Flowing Hydrant 1 (F1) | Pressure Hydrant 1 (P1) | Pressure Hydrant 2 (P2) | Flowing Hydrant 2 (F2) |
|---|---|---|---|
| Hydrant #: 0571 | Hydrant #: 0572 | Hydrant #: 0569 | Hydrant #: 0570 |
| Static PSI: 55 | Static PSI: 65 | Static PSI: 48 | Static PSI: 46 |
| Residual PSI: 53 | Residual PSI: 63 | Residual PSI: 46 | Residual PSI: 45 |
| Flow GPM: 631 | | | Flow GPM: |
| Duration: 10 MIN | | | Duration: 10 MIN |

Notes:

FLOW TESTING OF PRESSURE ZONE 542 BEGAN WITH TEST 1B, THEN 1C, THEN 1A

SEE ATTACHED MAP

carollo

E:\KRC D DRIVE\CAMAS\Hydrant Maps\Maps\Hydrant Test 1A.mxd


**Legend**

- Pressure Hydrant
- Flowing Hydrant
- Back-up Hydrant
- Existing Water Main

GREGG ON

CROWN ON

0 300 600 Feet

# HYDRANT FLOW TEST 1C FORM

CITY OF CAMAS
*MODEL VERIFICATION*

Date: 9/19/2016 Time: 3:24 PM Temperature: 67* F Pressure Zone: 542 Zone

Location:

**Flowing Hydrant 1 (F1)**
Hydrant #: 0571
Static PSI:
Residual PSI: 64
Flow GPM: 716
Duration: 5 MIN

**Pressure Hydrant 1 (P1)**
Hydrant #: 0572
Static PSI:
Residual PSI: 80

**Pressure Hydrant 2 (P2)**
Hydrant #: 0569
Static PSI:
Residual PSI: 58

**Flowing Hydrant 2 (F2)**
Hydrant #: 0570
Static PSI:
Residual PSI: 57
Flow GPM:
Duration: 5 MIN

Notes: SEE ATTACHED MAP

carollo

E:\KRC D DRIVE\CAMAS\Hydrant Maps\Maps\Hydrant Test 1A.mxd


**Legend**

- Pressure Hydrant
- Flowing Hydrant
- Back-up Hydrant
- Existing Water Main

0 500 1,000 Feet

# HYDRANT FLOW TEST 2 FORM

CITY OF CAMAS
*MODEL VERIFICATION*

Date: 9/19/2016 Time: 1:34 PM Temperature: 61* F Pressure Zone: 544 Zone

Location:

| Flowing Hydrant 1 (F1) | Pressure Hydrant 1 (P1) | Pressure Hydrant 2 (P2) | Flowing Hydrant 2 (F2) |
|---|---|---|---|
| Hydrant #: 0695 | Hydrant #: 0694 | Hydrant #: NO ID | Hydrant #: |
| Static PSI: 130 | Static PSI: 136 | Static PSI: 131 | Static PSI: |
| Residual PSI: 120 | Residual PSI: 125 | Residual PSI: 120 | Residual PSI: |
| Flow GPM: 876 | | | Flow GPM: |
| Duration: 3 MIN | | | Duration: |

Notes:

carollo

E:\KRC D DRIVE\CAMAS\Hydrant Maps\Maps\Hydrant Test 2.mxd


**Legend**

- Pressure Hydrant
- Flowing Hydrant
- Back-up Hydrant
- Existing Water Main

0 400 800 Feet

# HYDRANT FLOW TEST 3 FORM

CITY OF CAMAS
*MODEL VERIFICATION*

Date: 9/19/2016 Time: 12:56 PM Temperature: 61* F Pressure Zone: 697 Zone

Location:

| Flowing Hydrant 1 (F1) | Pressure Hydrant 1 (P1) | Pressure Hydrant 2 (P2) | Flowing Hydrant 2 (F2) |
|---|---|---|---|
| Hydrant #: 0302 | Hydrant #: 0303 | Hydrant #: 0298 | Hydrant #: |
| Static PSI: 60 | Static PSI: 68 | Static PSI: 80 | Static PSI: |
| Residual PSI: 55 | Residual PSI: 62 | Residual PSI: 74 | Residual PSI: |
| Flow GPM: 631 | | | Flow GPM: |
| Duration: 3 MIN | | | Duration: |

Notes:

carollo

E:\KRC D DRIVE\CAMAS\Hydrant Maps\Maps\Hydrant Test 3.mxd


**Legend**

- Pressure Hydrant
- Flowing Hydrant
- Back-up Hydrant
- Existing Water Main

0 400 800 Feet

# HYDRANT FLOW TEST 4 FORM

CITY OF CAMAS
*MODEL VERIFICATION*

Date: 9/19/2016 Time: 11:50 AM Temperature: 61* F Pressure Zone: 852 Zone

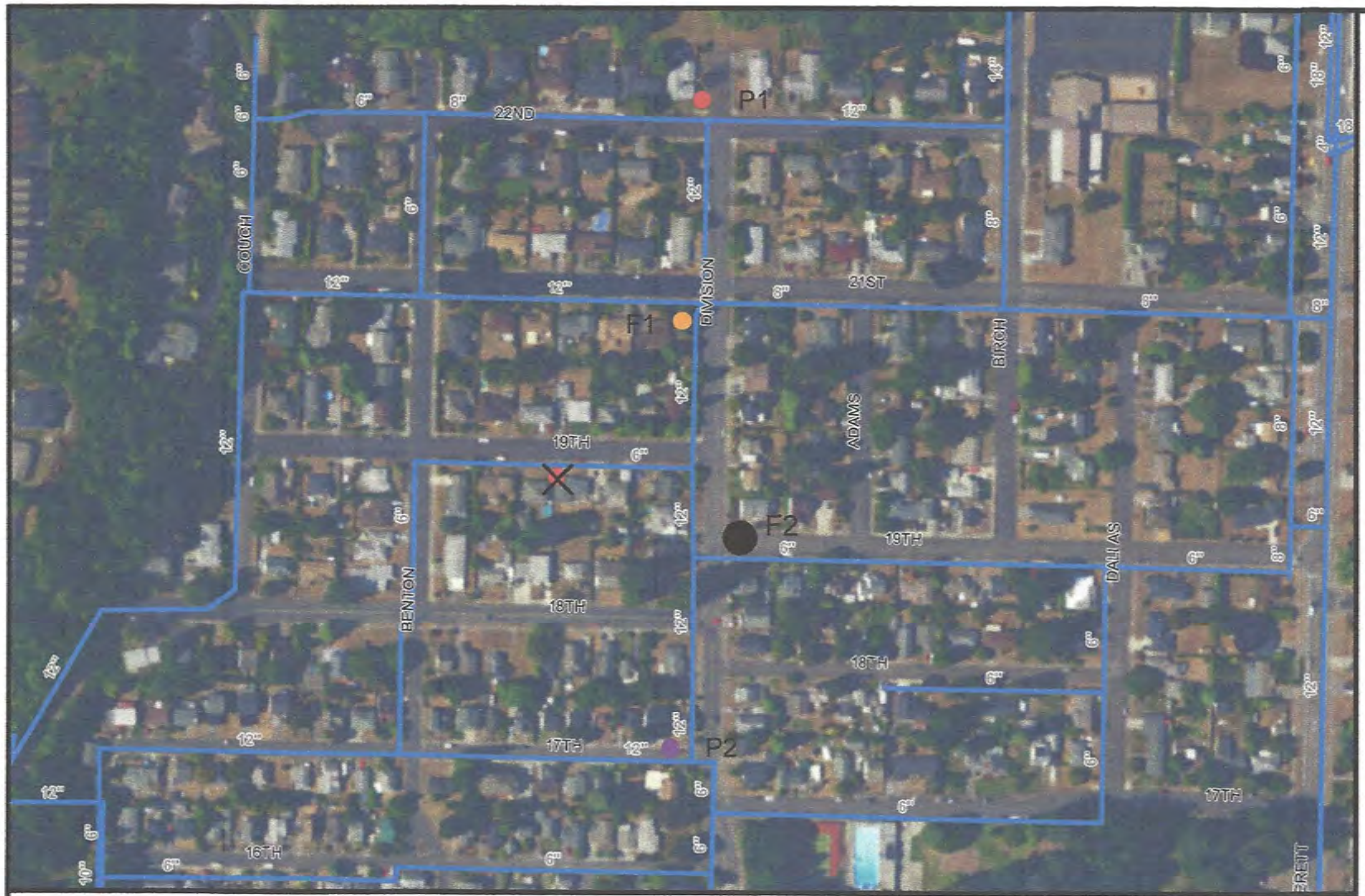
Location:

| Flowing Hydrant 1 (F1) | Pressure Hydrant 1 (P1) | Pressure Hydrant 2 (P2) | Flowing Hydrant 2 (F2) |
|---|---|---|---|
| Hydrant #: 0359 | Hydrant #: 0358 | Hydrant #: 0361 | Hydrant #: |
| Static PSI: 71 | Static PSI: 74 | Static PSI: 90 | Static PSI: |
| Residual PSI: 65 | Residual PSI: 71 | Residual PSI: 83 | Residual PSI: |
| Flow GPM: 716 | | | Flow GPM: |
| Duration: | | | Duration: |

Notes:

carollo

E:\KRC D DRIVE\CAMAS\Hydrant Maps\Maps\Hydrant Test 4.mxd




**Legend**

- Pressure Hydrant
- Flowing Hydrant
- Back-up Hydrant
- Existing Water Main

0 400 800 Feet

# HYDRANT FLOW TEST 5 FORM

CITY OF CAMAS
*MODEL VERIFICATION*

Date: 9/19/2016 Time: 11:15 AM Temperature: 61* F Pressure Zone: 455 Zone

Location:

| Flowing Hydrant 1 (F1) | Pressure Hydrant 1 (P1) | Pressure Hydrant 2 (P2) | Flowing Hydrant 2 (F2) |
|---|---|---|---|
| Hydrant #: | Hydrant #: | Hydrant #: | Hydrant #: |
| Static PSI: 84 | Static PSI: 86 | Static PSI: 86 | Static PSI: 85 |
| Residual PSI: 79 | Residual PSI: 85 | Residual PSI: 85 | Residual PSI: 85 |
| Flow GPM: 716 | | | Flow GPM: |
| Duration: 4 MIN | | | Duration: 4 MIN |

Notes:

carollo

E:\KRC D DRIVE\CAMAS\Hydrant Maps\Maps\Hydrant Test 5.mxd


**Legend**

- Pressure Hydrant
- Flowing Hydrant
- Back-up Hydrant
- Existing Water Main

0 400 800 Feet

# HYDRANT FLOW TEST 6 FORM

CITY OF CAMAS
*MODEL VERIFICATION*

Date: 9/19/2016 Time: 2:12 PM Temperature: 64* F Pressure Zone: 343 Zone

Location:

| Flowing Hydrant 1 (F1) | Pressure Hydrant 1 (P1) | Pressure Hydrant 2 (P2) | Flowing Hydrant 2 (F2) |
|---|---|---|---|
| Hydrant #: NO ID | Hydrant #: NO ID | Hydrant #: NO ID | Hydrant #: |
| Static PSI: 111 | Static PSI: 111 | Static PSI: 110 | Static PSI: |
| Residual PSI: 65 | Residual PSI: 90 | Residual PSI: 86 | Residual PSI: |
| Flow GPM: 475 | | | Flow GPM: |
| Duration: 3 MIN | | | Duration: |

Notes:

carollo

E:\KRC D DRIVE\CAMAS\Hydrant Maps\Maps\Hydrant Test 6.mxd

# APPENDIX K – DESIGN STANDARDS

**City of Camas Water Details ~ INDEX**

| Detail No. | Detail Name | Rev. | Rev. Date |
|---|---|---|---|
| W1 | Water Notes | 1 | 5/1/2007 |
| W2 | 1" Water Service - New (Subdivision) | 1 | 5/1/2007 |
| W3 | 1" Water Service - Replacement | 1 | 5/1/2007 |
| W4 | 1" Water Service - Meter Relocation | 1 | 5/1/2007 |
| W5 | 1" Water Service - Rural | 1 | 5/1/2007 |
| W6 | 2" Water Service | 1 | 5/1/2007 |
| W7a & b | 3" Water Service | 1 | 5/1/2007 |
| W8 | 2" Standard Blowoff | 2 | 9/18/2007 |
| W9 | 6" Low Point Blowoff - Ditch | 1 | 5/1/2007 |
| W10 | 6" Low Point Blowoff - Street | 1 | 5/1/2007 |
| W11 | Fire Hydrant | 1 | 5/1/2007 |
| W12 | Valve Box and Riser | 1 | 5/1/2007 |
| W13 | Water Main Line and Valve | 1 | 5/1/2007 |
| W14 | Pipe Joint Restraint | 1 | 5/1/2007 |
| W15 | Thrust Block | 1 | 5/1/2007 |
| W16 | 2" Air/Vacuum Release Valve | 2 | 9/18/2007 |
| W17 | 2" Pressure Relief Valve Assembly | 1 | 5/1/2007 |
| W18 | 4" Vacuum Relief Valve | 1 | 5/1/2007 |
| W19a & b | 6"x2" PRV Station with 3" Relief | 1 | 5/1/2007 |
| W20 | Above Ground PRV Relief Drain | 1 | 5/1/2007 |
| W21 | Water Quality Sampling Station | 1 | 5/1/2007 |
| W22a & b | Standard Double Check Detector Valve Assembly | 1 | 5/1/2007 |
| W23 | Utility Crossing Detail | 1 | 5/1/2007 |

## WATER CONSTRUCTION NOTES:

1. ALL TRENCH EXCAVATION AND PIPE INSTALLATION SHALL CONFORM TO THE MOST CURRENT A.W.W.A. STANDARDS, AND THE MOST RECENTLY ADOPTED EDITION OF THE W.S.D.O.T. STANDARD SPECIFICATIONS SECTION 7-08.3(1) AND SECTION 7-08.3(2). ALL EXCESS MATERIAL FROM THE TRENCH EXCAVATION SHALL BE DISPOSED OF AT AN APPROVED SITE.

2. PIPE BEDDING, PIPE ZONE MATERIAL AND TRENCH BACKFILL SHALL BE AN APPROVED GRANULAR MATERIAL OF EITHER WASHED SCREENINGS OR 5/8 INCH MINUS CRUSHED ROCK. SAND BACKFILL IS NOT ALLOWED.

3. TRENCH COMPACTION SHALL CONFORM TO THE MOST RECENTLY ADOPTED EDITION OF THE W.S.D.O.T. STANDARD SPECIFICATIONS SECTION 7-08.3(3). CONTRACTOR TO DETERMINE THE TYPE OF EQUIPMENT AND METHOD USED TO ACHEIVE THE REQUIRED COMPACTION AND BE APPROVED BY THE CITY OF CAMAS. EACH LIFT SHALL BE COMPACTED TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY THE A.A.S.H.T.O. T-180 TEST METHOD.

4. SETTLEMENT OF THE FINISHED SURFACE WITHIN THE WARRANTY PERIOD SHALL BE CONSIDERED TO BE A RESULT OF IMPROPER COMPACTION AND SHALL BE PROMPTLY REPAIRED BY THE CONTRACTOR AT NO EXPENSE TO THE CITY.

5. ALL VALVES 10 INCHES OR LESS IN DIAMETER SHALL BE A.W.W.A. APPROVED RESILIENT WEDGE GATE VALVES, BUBBLE TIGHT AT 200PSI, HAVE NON RISING STEMS, AND OPEN BY TURNING TO THE LEFT. PROVIDE A 2 INCH SQUARE NUT TO CONFORM TO A.W.W.A. C-504. ALL VALVES 12 INCHES OR LARGER IN DIAMETER SHALL BE A.W.W.A. APPROVED BUTTERFLY VALVES.

6. ALL WATER PIPE 12 INCHES OR LESS IN DIAMETER SHALL BE DUCTILE IRON CLASS 52 PIPE. ALL WATER PIPE 14 INCHES IN DIAMETER AND LARGER SHALL BE DUCTILE IRON CLASS 51 PIPE. RUBBER GASKET TYPE SHALL BE U.S. PIPE, TYTON OR APPROVED EQUAL. ALL FITTINGS SHALL BE DUCTILE IRON AND SHALL CONFORM TO THE A.W.W.A. STANDARD C-110.

7. ALL TEES, FLANGES, CAPS, BENDS AND OFFSETS, AS WELL AS ALL OTHER APPURTENCES WHICH ARE SUBJECT TO UNBALANCED THRUST, SHALL BE PROPERLY BRACED BY ONE OF THE FOLLOWING METHODS:
   A. CONCRETE THRUST BLOCKING- AS DETAILED IN THE PLANS, SHALL BE PLACED AT BENDS, TEES, DEAD ENDS AND CROSSES. BLOCKING SHALL BE 3000 PSI CONCRETE POURED IN PLACE. CONCRETE BLOCKING SHALL BE AGAINST SOLID UNDISTURBED EARTH AT THE SIDES AND BOTTOM OF THE TRENCH EXCAVATION AND SHALL BE SHAPED SO AS NOT TO OBSTRUCT ACCESS TO THE JOINTS OF THE PIPE. 6 MIL. PLASTIC SHALL BE USED TO INSULATE PIPE.
   B. MECHANICAL JOINT RESTRAINT-USE "EBBA IRON SERIES 1100 MEGA LUG MECHANICAL JOINT THRUST RESTRAINT" OR APPROVED EQUAL. CONTRACTOR TO RESTRAIN THE MINIMUM REQUIRED PIPE LENGTH WITH "FIELD-LOK" GASKETS OR APPROVED EQUAL.

8. ALL WATER MAINS SHALL BE TESTED AT 200PSI IN ACCORDANCE WITH SECTION 7-11.3(11) OF THE STANDARD SPECIFICATIONS. THE CITY SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF ACCEPTANCE TESTING. MAXIMUM LENGTH OF PIPE TO BE TESTED AT ONE TIME IS 1000 FT.

9. CHLORINATION SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 7-11.3(12) OF THE STANDARD SPECIFICATIONS. CITY INSPECTOR WILL TAKE SAMPLES AND DELIVER TO LABORATORY FOR BACTERIA TESTING, NEGATIVE SAMPLE RESULTS SHALL BE CONFIRMED, PRIOR TO PRESSURE TESTING. DECLORINATION OR DISPOSAL TO SANITARY MAIN MAY BE REQUIRED.

10. APPROPRIATE DISPOSAL AND OR DECHLORINATION OF FLUSHED WATER DURING BLOWOFF IS THE RESPONSIBILITY OF THE CONTRACTOR. METHOD USED SHALL BE APPROVED BY CITY AND OTHER REGULATING AUTHORITIES.

11. WATER MAIN TO HAVE A MINIMUM COVER OF 30 INCHES. WATER SERVICES TO HAVE A MINIMUM 24" OF COVER.

12. ALL EXISTING VALVES TO BE OPERATED BY CITY OF CAMAS WATER/SEWER DEPARTMENT PERSONNEL ONLY.

13. NO CONNECTIONS TO EXISTING WATER MAINS SHALL BE MADE PRIOR TO SATISFACTORY PRESSURE TESTING, DISINFECTION, AND THE CONFIRMATION OF A NEGATIVE BACTERIA TEST.

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/06 | COUNCIL | RES1071 |
| 2 | 5/1/07 | SD | JC |
| | | | |
| | | | |

CITY OF CAMAS ~ WATER DETAIL

WATER CONSTRUCTION NOTES

James C. Carothers 5-8-07

DETAIL APPROVED BY DATE

NO SCALE

DETAIL NO. W1

WTR-NOTES.DWG

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/06 | RES1071 | COUNCIL |
| 2 | 5/1/07 | SD | JC |

CITY OF CAMAS ~ WATER DETAIL

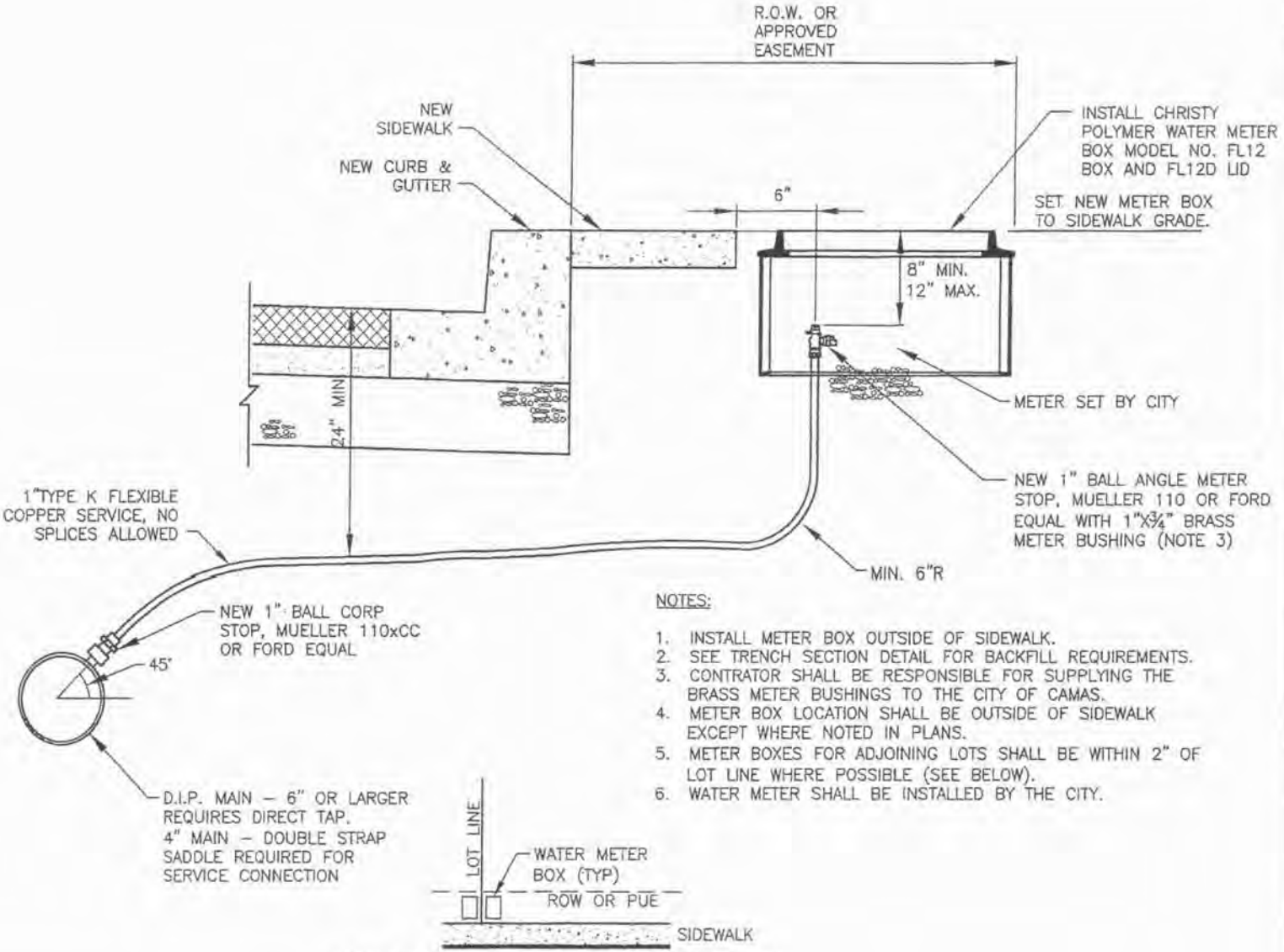
# 1" WATER SERVICE – NEW (SUBDIVISION)

DETAIL APPROVED BY

5-8-07
DATE

NO SCALE

DETAIL NO. W2



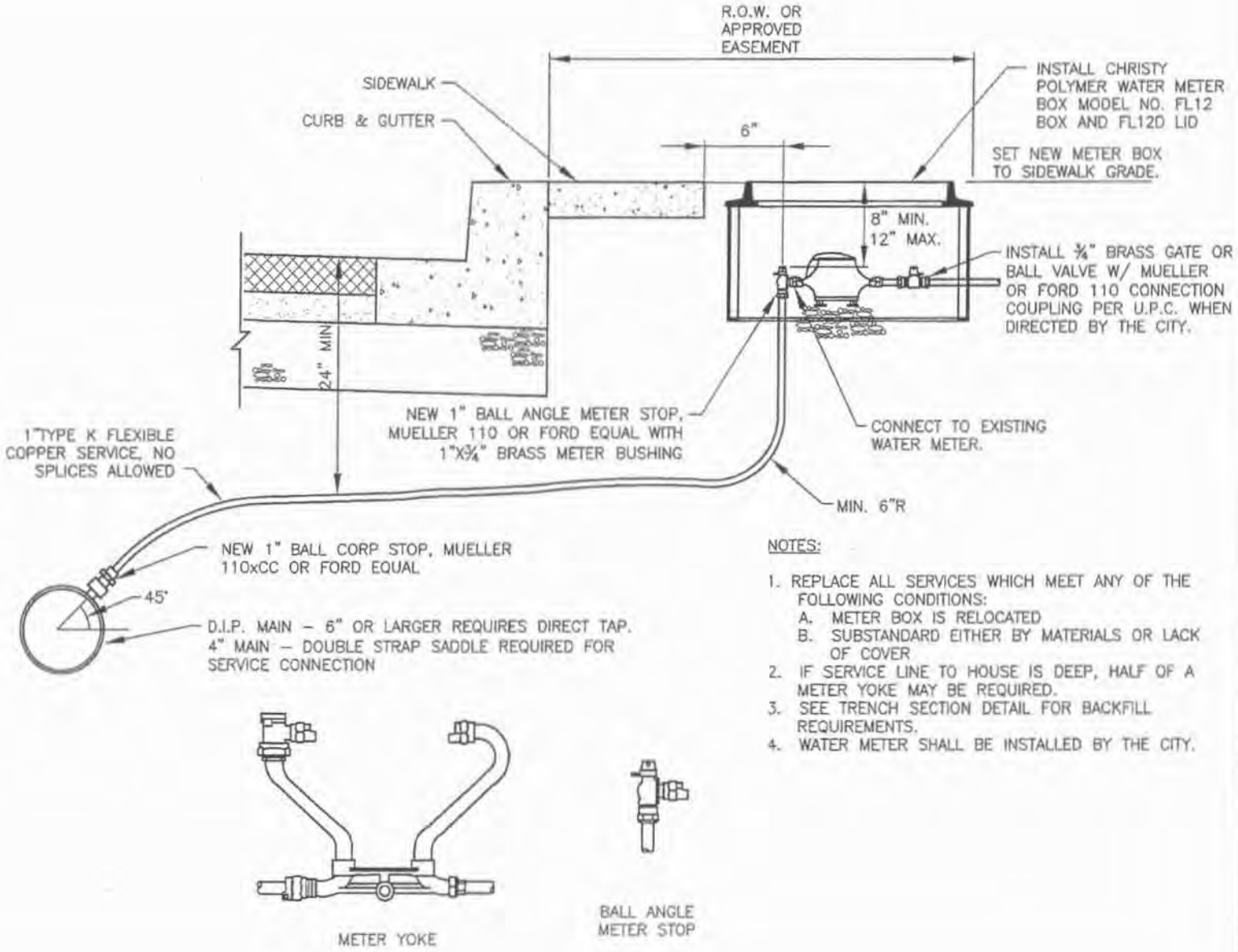

LOCATION OF ADJOINING LOT METER BOXES

NOTES:

1. INSTALL METER BOX OUTSIDE OF SIDEWALK.
2. SEE TRENCH SECTION DETAIL FOR BACKFILL REQUIREMENTS.
3. CONTRATOR SHALL BE RESPONSIBLE FOR SUPPLYING THE BRASS METER BUSHINGS TO THE CITY OF CAMAS.
4. METER BOX LOCATION SHALL BE OUTSIDE OF SIDEWALK EXCEPT WHERE NOTED IN PLANS.
5. METER BOXES FOR ADJOINING LOTS SHALL BE WITHIN 2" OF LOT LINE WHERE POSSIBLE (SEE BELOW).
6. WATER METER SHALL BE INSTALLED BY THE CITY.



WTR-WS.DWG




NOTES:

1. REPLACE ALL SERVICES WHICH MEET ANY OF THE FOLLOWING CONDITIONS:
   A. METER BOX IS RELOCATED
   B. SUBSTANDARD EITHER BY MATERIALS OR LACK OF COVER
2. IF SERVICE LINE TO HOUSE IS DEEP, HALF OF A METER YOKE MAY BE REQUIRED.
3. SEE TRENCH SECTION DETAIL FOR BACKFILL REQUIREMENTS.
4. WATER METER SHALL BE INSTALLED BY THE CITY.

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/08 | RES1071 | COUNCIL |
| 2 | 5/1/07 | SD | JC |

CITY OF CAMAS – WATER DETAIL

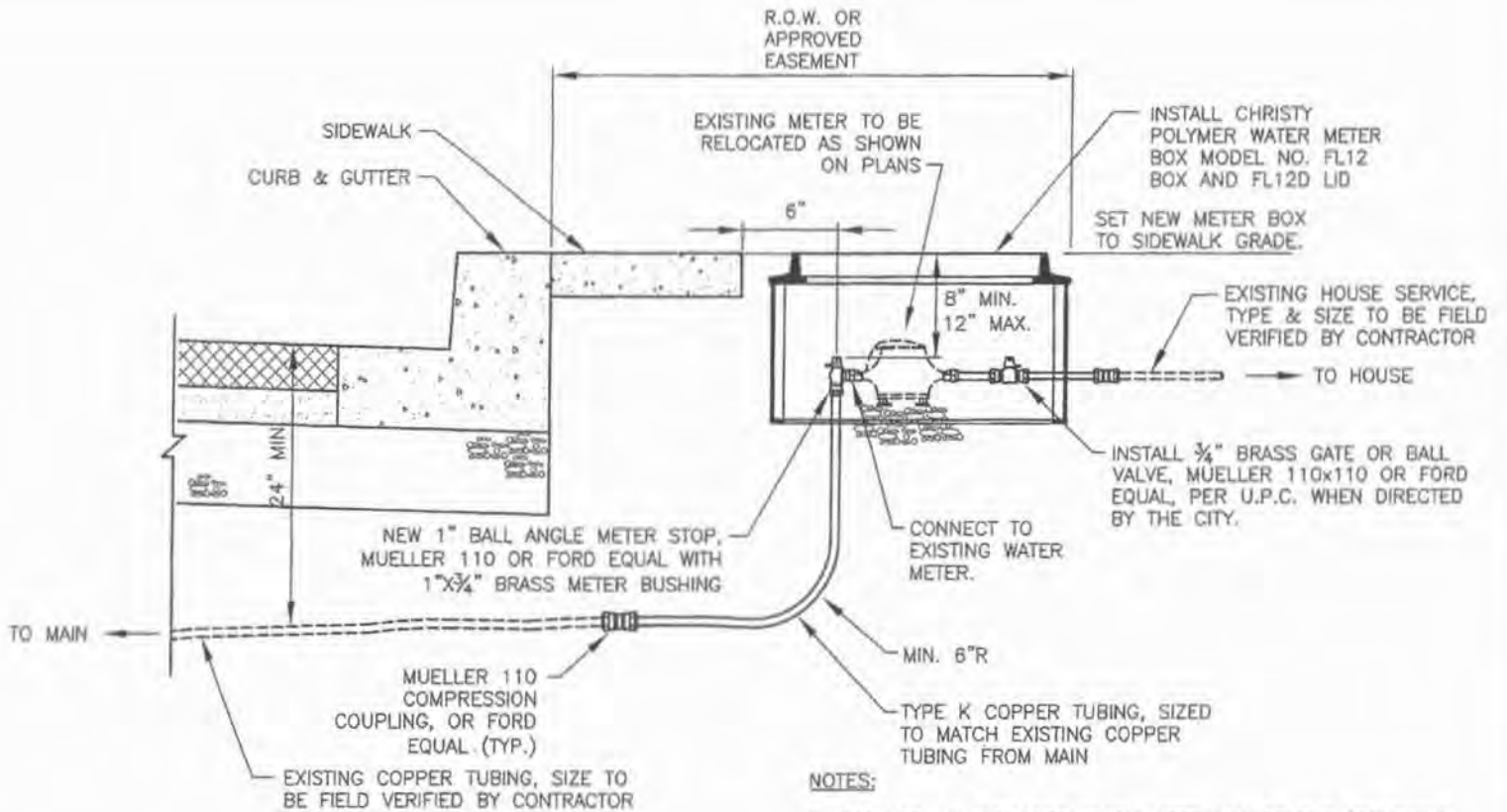
1" WATER SERVICE – REPLACEMENT

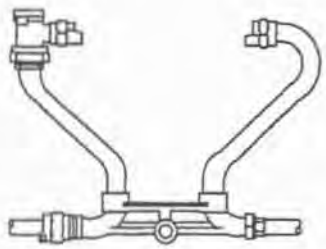
DETAIL APPROVED BY: [signature] DATE 5-8-07

NO SCALE

DETAIL NO. W3

WTR–WS.DWG



METER YOKE

BALL ANGLE METER STOP

NOTES:

1. REPLACE ALL SERVICES WHICH MEET ANY OF THE FOLLOWING CONDITIONS:
   A. METER BOX IS RELOCATED
   B. SUBSTANDARD EITHER BY MATERIALS OR LACK OF COVER
   C. METER IS TOO DEEP AND A YOKE MUST BE ADDED.
2. IF SERVICE LINE TO HOUSE IS DEEP, HALF OF A METER YOKE MAY BE REQUIRED.
3. IF SERVICE IS NOT COPPER, CONTRACTOR IS TO REFER TO DETAIL W3 (REPLACEMENT WATER SERVICE) FOR INSTALLATION.
4. FOR SERVICE RELOCATIONS, ONLY ONE FITTING IS ALLOWED BETWEEN THE CORP STOP AND THE METER STOP. A METER ADAPTER REDUCING FROM A 1" SERVICE TO A SMALLER METER MAY BE ALLOWED IN ADDITION TO THE ONE FITTING.
5. INSTALL METER BOX OUTSIDE OF SIDEWALK
6. CALL FOR INSPECTION OF COUPLING UNDER PRESSURE PRIOR TO BACKFILLING.
7. SEE TRENCH SECTION DETAIL FOR BACKFILL REQUIREMENTS.
8. WATER METER SHALL BE INSTALLED BY THE CITY.

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/06 | RES1071 | COUNCIL |
| 2 | 5/1/07 | SD | JC |

CITY OF CAMAS - WATER DETAIL

1" WATER SERVICE - METER RELOCATION

DETAIL APPROVED BY

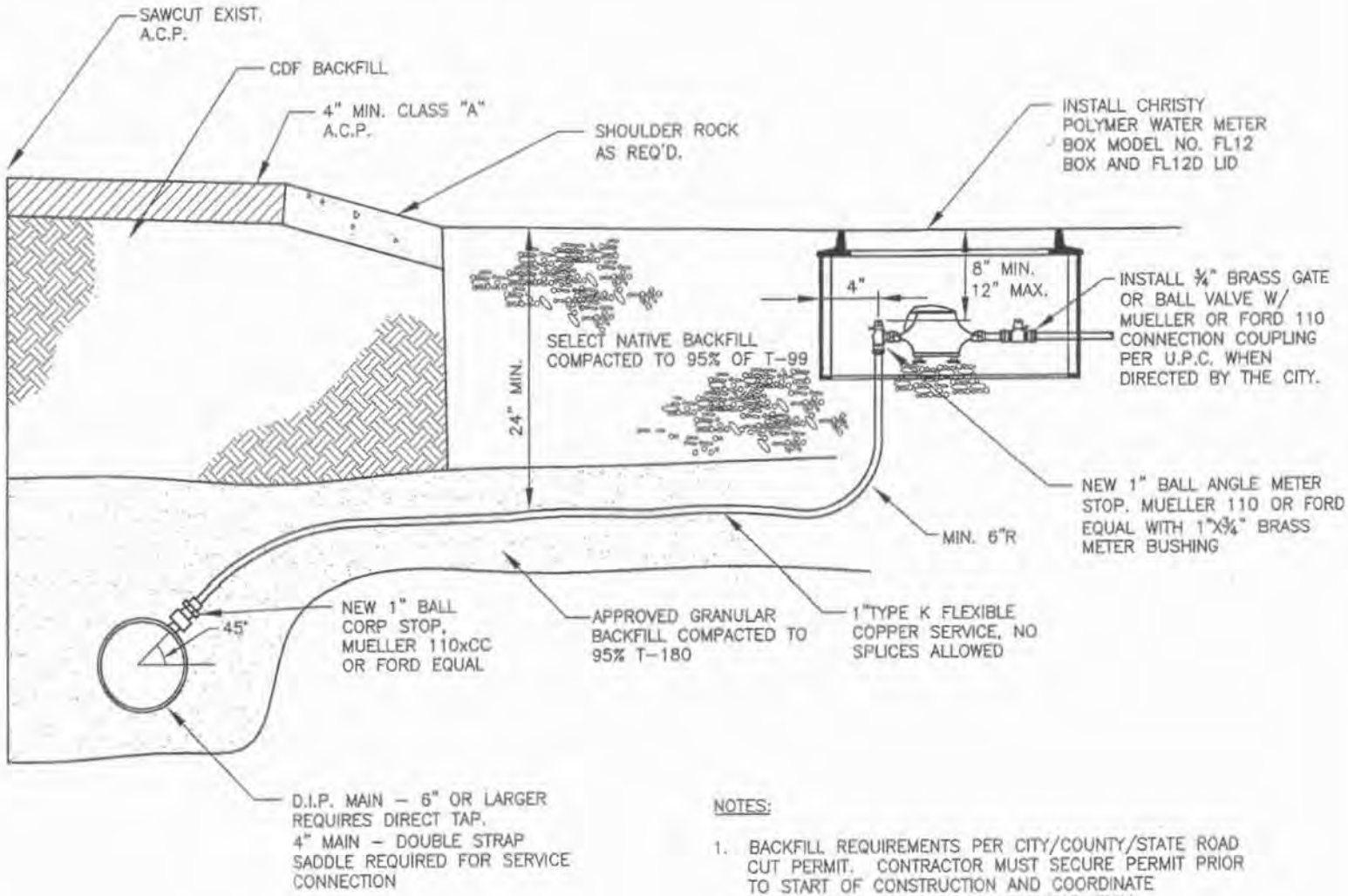
5-8-07
DATE

NO SCALE

DETAIL NO. W4



WTR-WS.DWG




NOTES:

1. BACKFILL REQUIREMENTS PER CITY/COUNTY/STATE ROAD CUT PERMIT. CONTRACTOR MUST SECURE PERMIT PRIOR TO START OF CONSTRUCTION AND COORDINATE INSPECTION WITH APPROPRIATE JURISDICTION.
2. WATER METER SHALL BE INSTALLED BY THE CITY

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/08 | RES1071 | COUNCIL |
| 2 | 5/1/07 | SD | JC |

CITY OF CAMAS ~ WATER DETAIL

1" WATER SERVICE – RURAL

DETAIL APPROVED BY

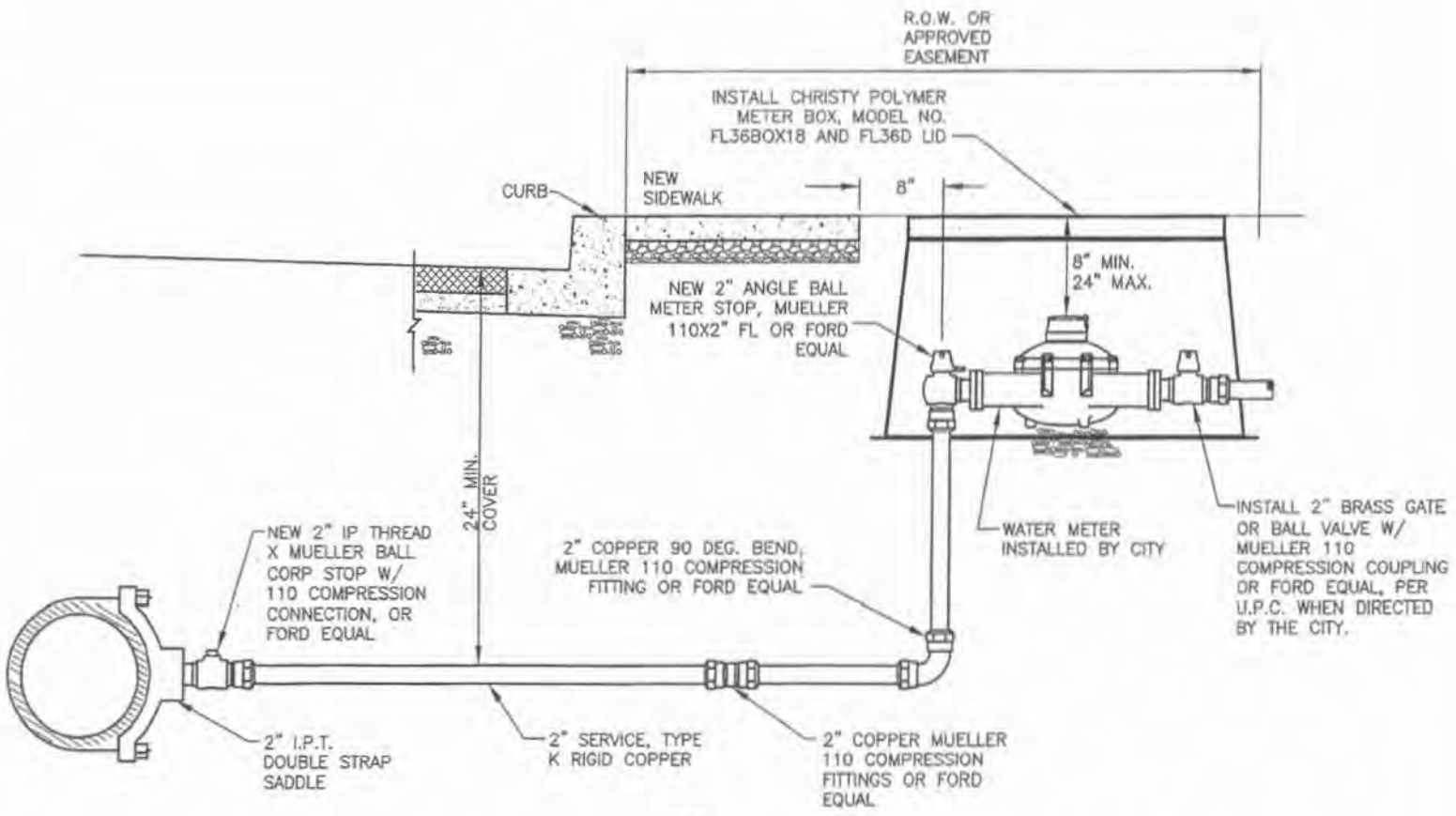
5-8-07
DATE

NO SCALE

DETAIL NO. W5



WTR-WS.DWG




NOTES:

1. REPLACE ALL SERVICES WHICH MEET ANY OF THE FOLLOWING CONDITIONS:
   A. METER BOX IS RELOCATED
   B. SUBSTANDARD EITHER BY MATERIALS OR LACK OF COVER
2. INSTALL CHRISTY POLYMER METER BOX, MODEL NO. FL36BOX18 AND FL36D LID, OUTSIDE OF SIDEWALK. INSTALL FL36X6 OR FL36X8 BASE EXTENSIONS AS REQUIRED.
3. INSTALL COMPRESSION FITTINGS OUTSIDE OF STREET WHERE POSSIBLE.
4. SEE TRENCH SECTION DETAIL FOR BACKFILL REQUIREMENTS.
5. WATER METER SHALL BE INSTALLED BY THE CITY.

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/06 | RES1071 | COUNCIL |
| 2 | 5/1/07 | SD | JC |

CITY OF CAMAS ~ WATER DETAIL

# 2" WATER SERVICE

DETAIL APPROVED BY

5-8-07
DATE

NO SCALE

DETAIL NO. W6

WTR-WS2.DWG

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/06 | COUNCIL | RES1071 |
| 2 | 5/1/07 | SD | JC |

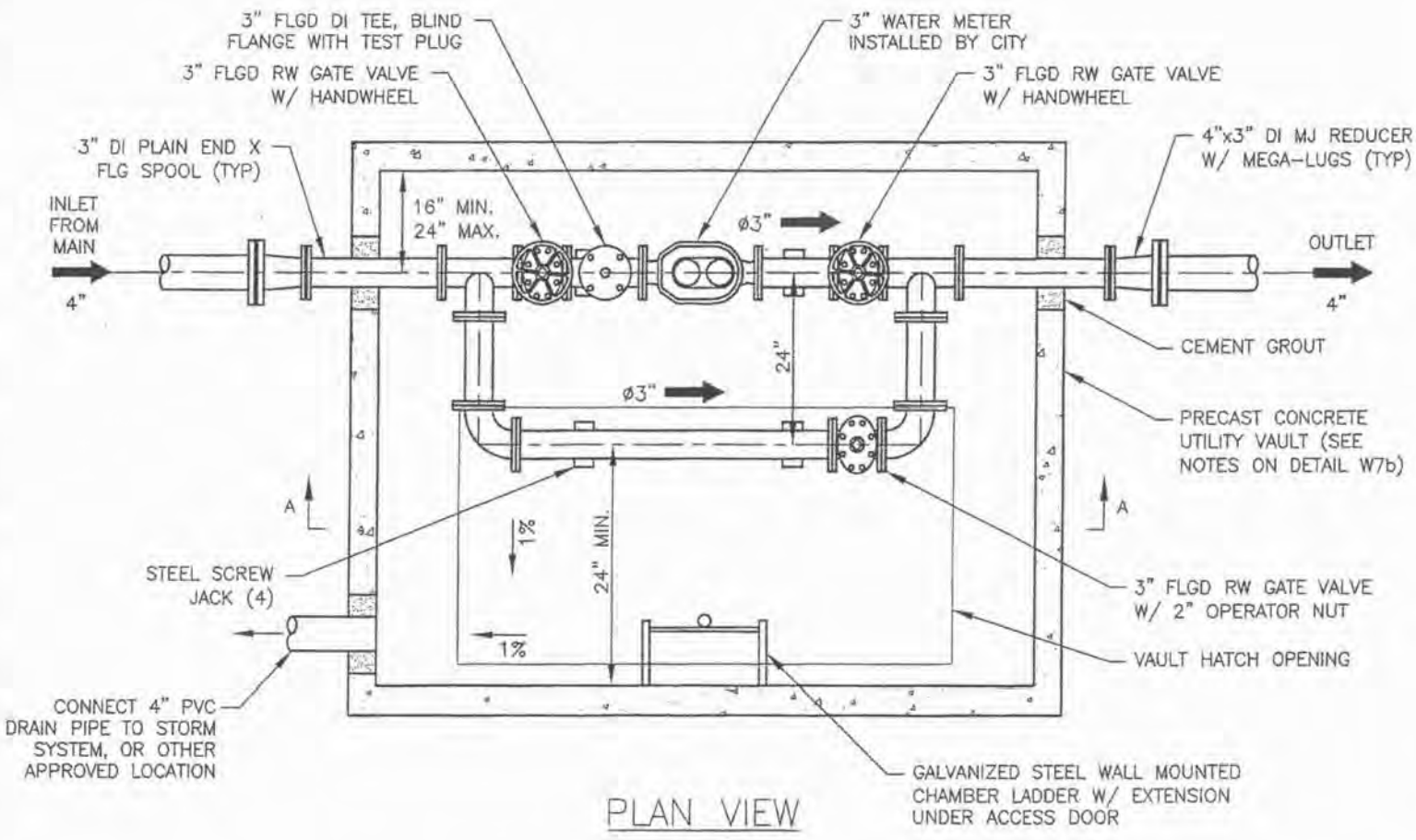
CITY OF CAMAS ~ WATER DETAIL

# 3" WATER SERVICE

DETAIL APPROVED BY: Steven E. Dietzman 5-8-07 DATE

NO SCALE

DETAIL NO. W7a



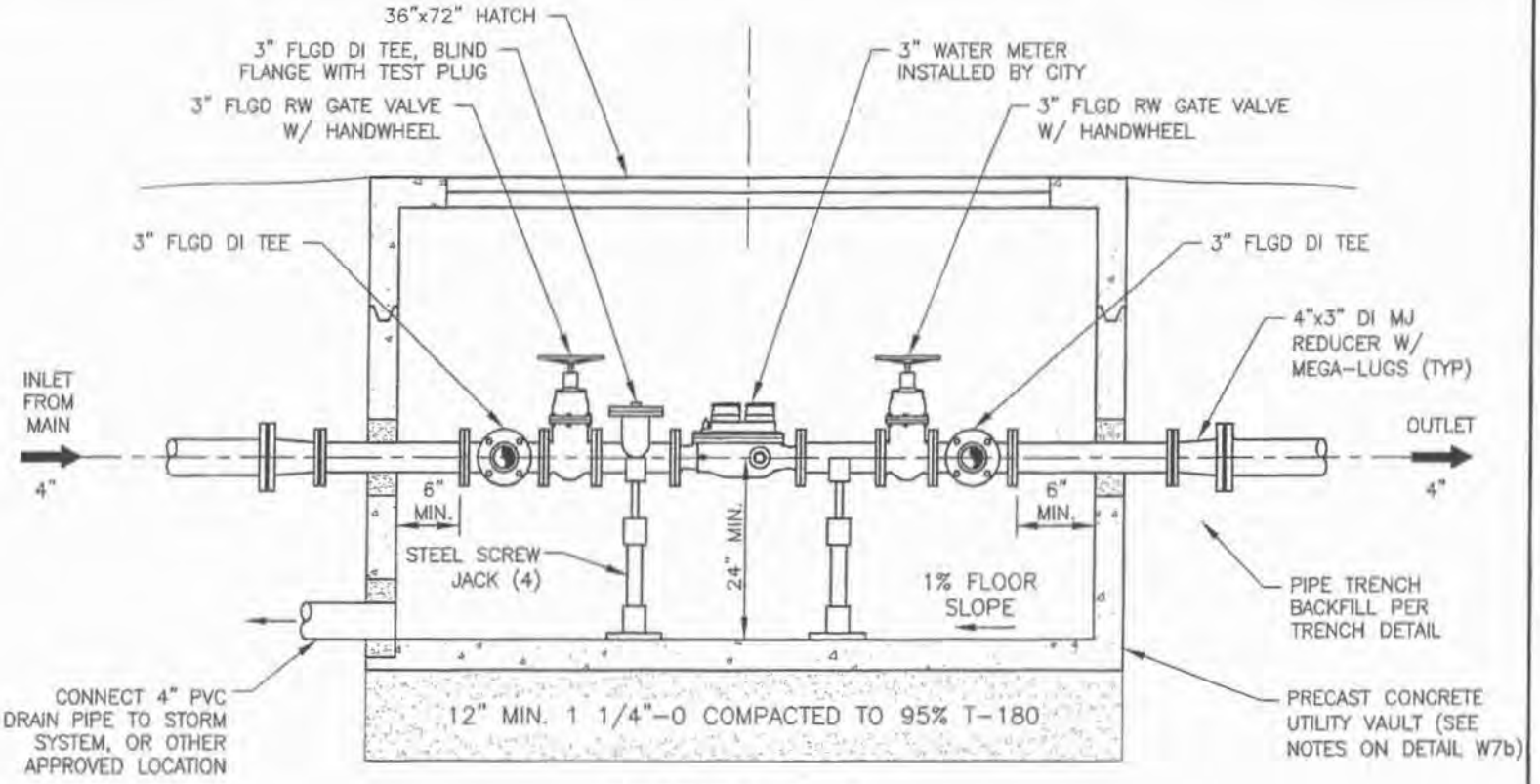

PLAN VIEW

WATER METER NOTES:

1. FOR NEW MAINS, INSTALL MAIN SIZE MJ x 4" FL TEE. FOR EXISTING MAINS, LIVE TAP TO BE PERFORMED BY APPROVED TAPPING CONTRACTOR.
2. PROVIDE APPROVED JOINT RESTRAINT FOR ALL JOINTS ON 4" DUCTILE IRON PIPE. MINIMUM COVER 30".
3. PROVIDE FLANGED CONNECTIONS FOR ALL JOINTS ON 3" DUCTILE IRON PIPE AND FITTINGS.



WTR-WS3.DWG




## SECTION A–A

(BY–PASS LINE REMOVED FOR CLARITY)

VAULT CONSTRUCTION NOTES:

1. VAULT SHALL BE PRE–APPROVED PRIOR TO INSTALLATION.
2. VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
3. APPROVED VAULT SHALL BE RATED FOR H20 LOADING AND INCLUDE AN EXTENSION LADDER, MINIMUM INSIDE DIMENSIONS 8'Lx6'Wx5'H.
4. VAULT SHALL BE SET FOR 1% SLOPE TO DRAIN.
5. ALL BACKFILL SHALL BE APPROVED GRANULAR MATERIAL.
6. HATCH SHALL BE AN H20 RATED, 36"x72" SPRING ASSISTED, HOT DIPPED GALVANIZED DIAMOND PLATE DOUBLE DOOR. FOR TRAFFIC INSTALLATIONS A 30" MANHOLE LID SHALL BE USED INSTEAD OF A HATCH.
7. SUMP PUMP MAY BE REQUIRED ON INSTALLATIONS WHERE DRAIN PIPE CANNOT BE CONNECTED TO ADEQUATE STORM DRAIN SYSTEM. THE APPROVED SUMP PUMP SHALL BE A COMMERCIAL GRADE WATER POWERED VENTURI DESIGN WITH BACKFLOW PREVENTION, SIZED TO PROVIDE 10GPM AT 10 FEET OF HEAD AT THE AVAILABLE SYSTEM WATER PRESSURE. BACKFLOW DEVICE SHALL BE CERTIFIED BY WASHINGTON STATE CERTIFIED BACKFLOW TESTER AFTER INSTALLATION AND PRIOR TO ACCEPTANCE. TEST RESULTS SHALL BE SENT TO CITY OF CAMAS WATER DEPARTMENT.

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/06 | COUNCIL | RES1071 |
| 2 | 5/1/07 | SD | JC |

CITY OF CAMAS ~ WATER DETAIL

3" WATER SERVICE

DETAIL APPROVED BY

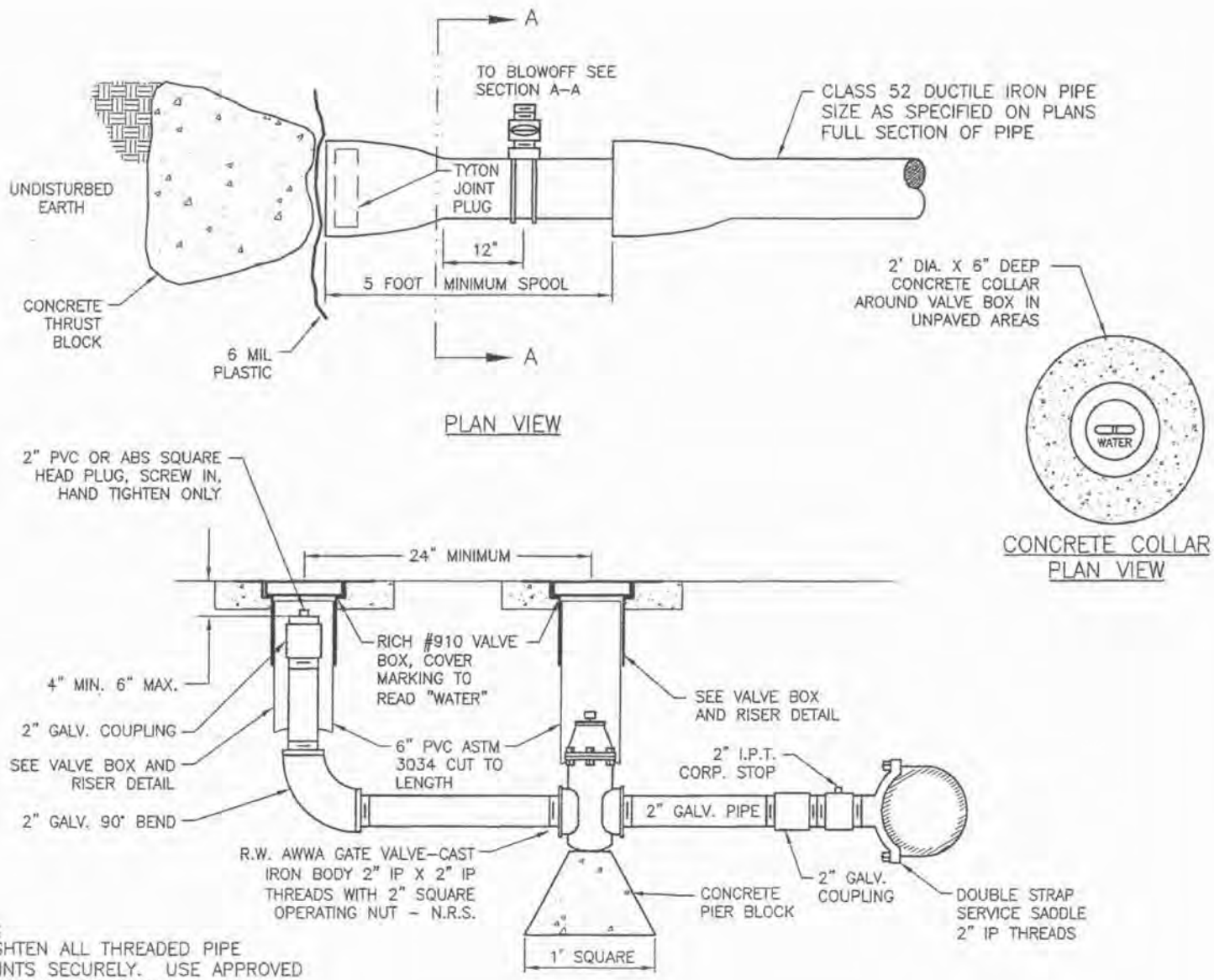
5-8-07
DATE

NO SCALE

DETAIL NO. W7b



WTR-WS3.DWG




NOTES:

1. TIGHTEN ALL THREADED PIPE JOINTS SECURELY. USE APPROVED JOINTING COMPOUND.
2. SWAB ALL PIPE WITH CHLORINE MIXTURE PRIOR TO SERVICE.

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/06 | COUNCIL | RES1071 |
| 2 | 5/1/07 | SD | JC |
| 3 | 9/18/07 | SD | JC |

CITY OF CAMAS - WATER DETAIL

2" STANDARD BLOWOFF

DETAIL APPROVED BY

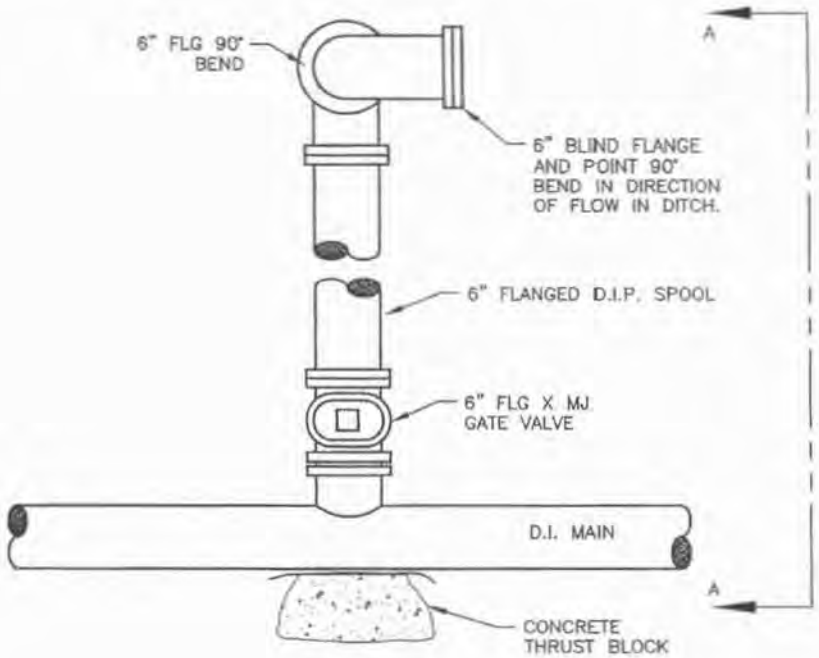
DATE 9-21-07

NO SCALE

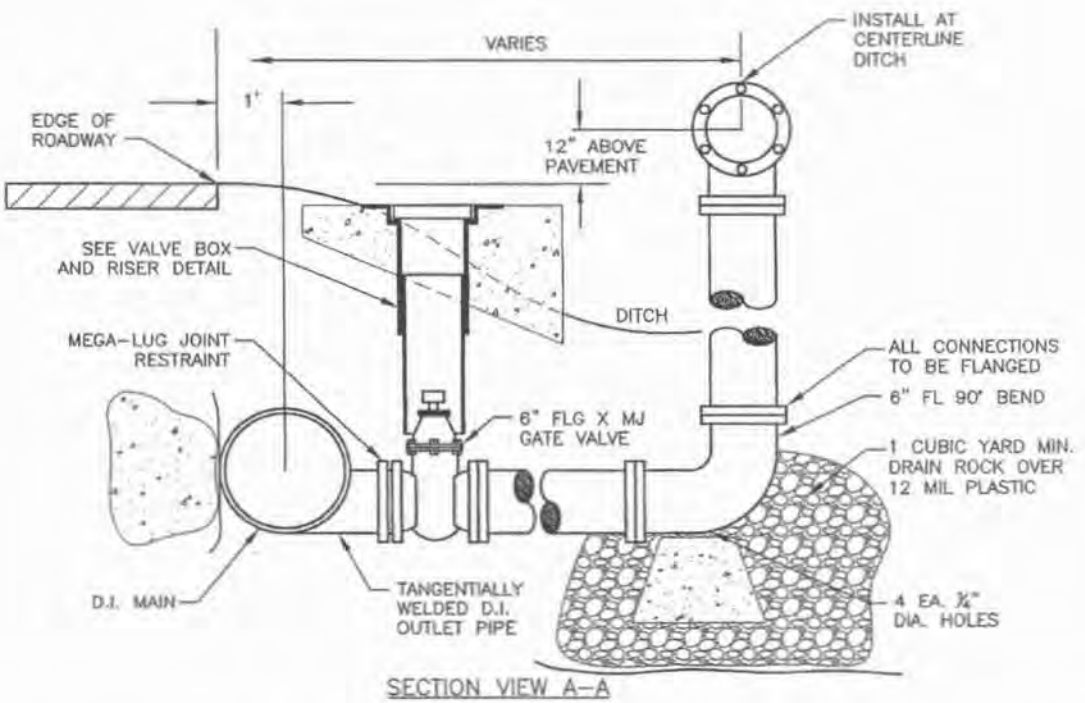
DETAIL NO. W8



WTR-BLWOFF.DWG




PLAN VIEW




SECTION VIEW A-A

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 5/1/07 | SD | JC |
| | | | |
| | | | |
| | | | |

CITY OF CAMAS ~ WATER DETAIL

6" LOW POINT BLOW OFF – DITCH

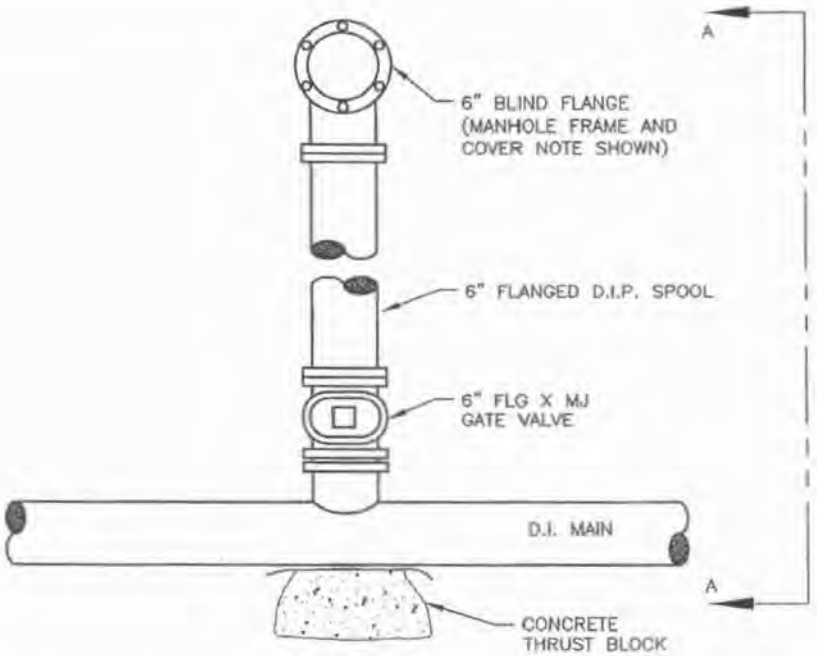
Jann C. Cauthorn 5-8-07

DETAIL APPROVED BY DATE

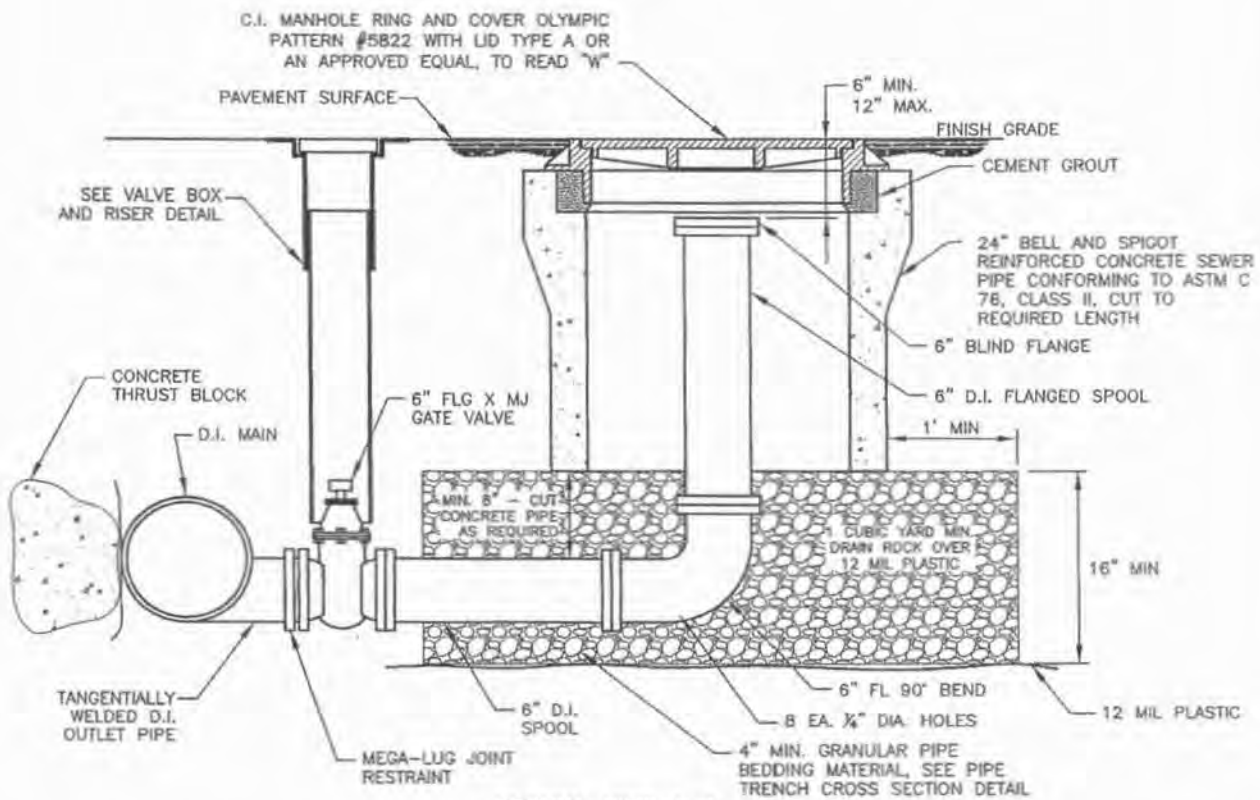
NO SCALE

DETAIL NO. W9

6BLOWOFF.DWG




PLAN VIEW




SECTION VIEW A–A

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 5/1/07 | SD | JC |
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| | | | |

CITY OF CAMAS ~ WATER DETAIL

6" LOW POINT BLOW OFF – STREET

DETAIL APPROVED BY 5-8-07 DATE

NO SCALE

DETAIL NO. W10

6BLOWOFF.DWG

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/06 | RES1071 | COUNCIL |
| 2 | 5/1/07 | SD | JC |

CITY OF CAMAS - WATER DETAIL

# FIRE HYDRANT

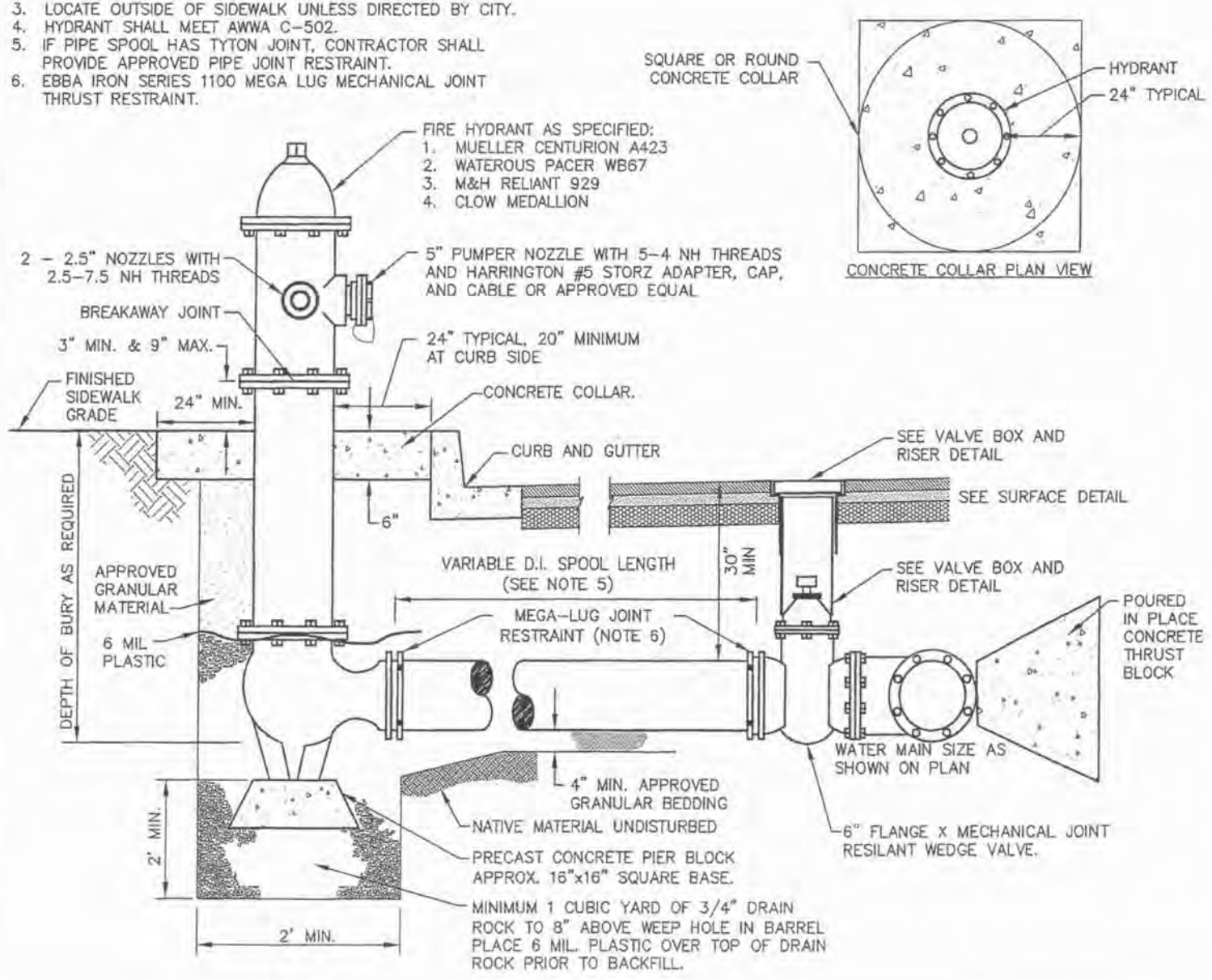
DETAIL APPROVED BY

5-8-07
DATE

NO SCALE

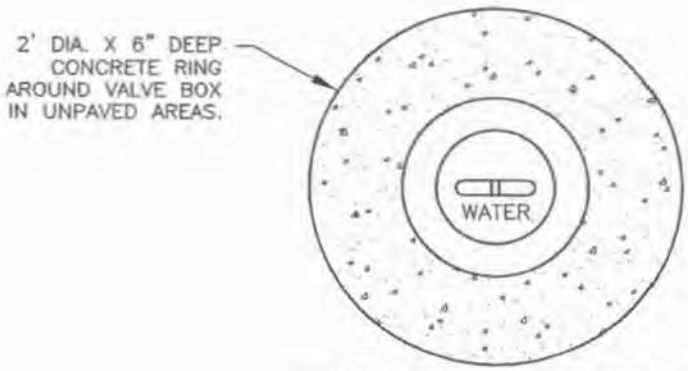
DETAIL NO. W11

NOTES:
1. HYDRANT SHALL BE SET PLUMB.
2. HYDRANT TO BE PAINTED WITH TWO COATS OF PAINT, TYPE AND COLOR SPECIFIED BY CITY.
3. LOCATE OUTSIDE OF SIDEWALK UNLESS DIRECTED BY CITY.
4. HYDRANT SHALL MEET AWWA C-502.
5. IF PIPE SPOOL HAS TYTON JOINT, CONTRACTOR SHALL PROVIDE APPROVED PIPE JOINT RESTRAINT.
6. EBBA IRON SERIES 1100 MEGA LUG MECHANICAL JOINT THRUST RESTRAINT.

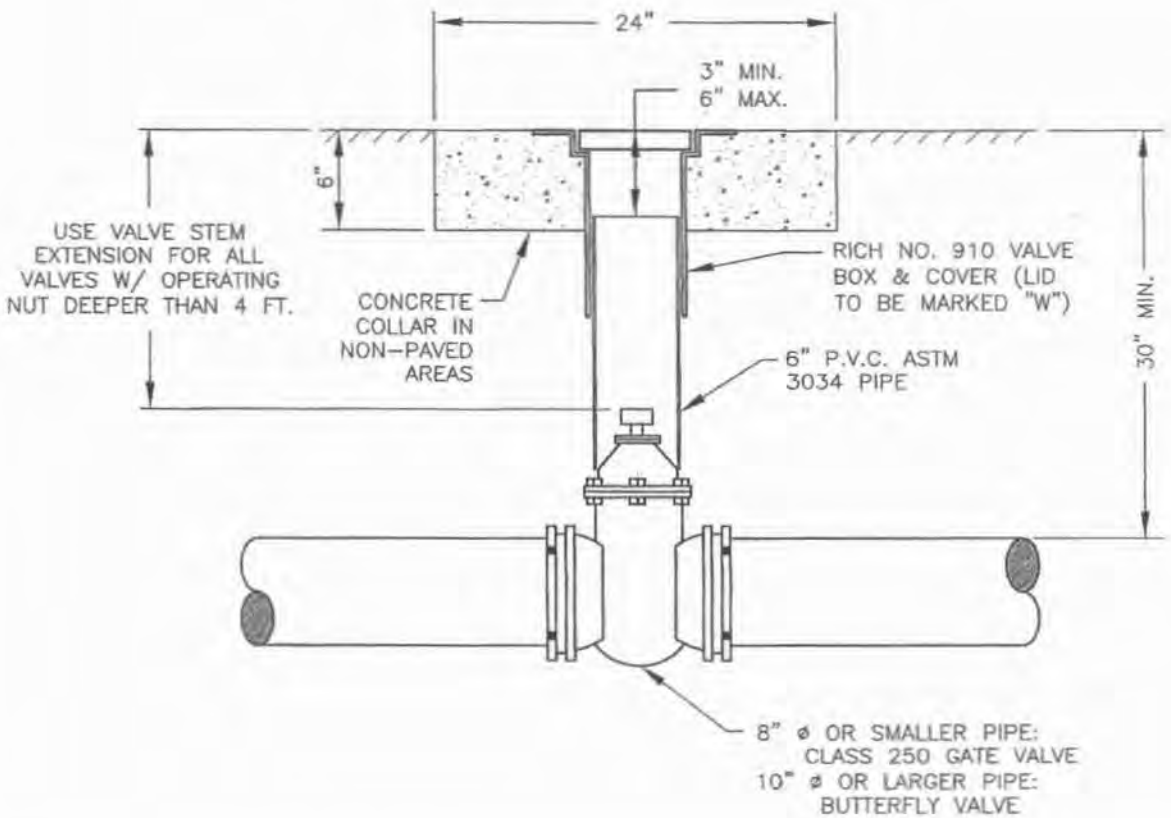





WTR-FHYD.DWG




CONCRETE COLLAR PLAN VIEW




| REV. NO. | DATE | BY | APPR. |
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CITY OF CAMAS ~ WATER DETAIL

VALVE BOX AND RISER

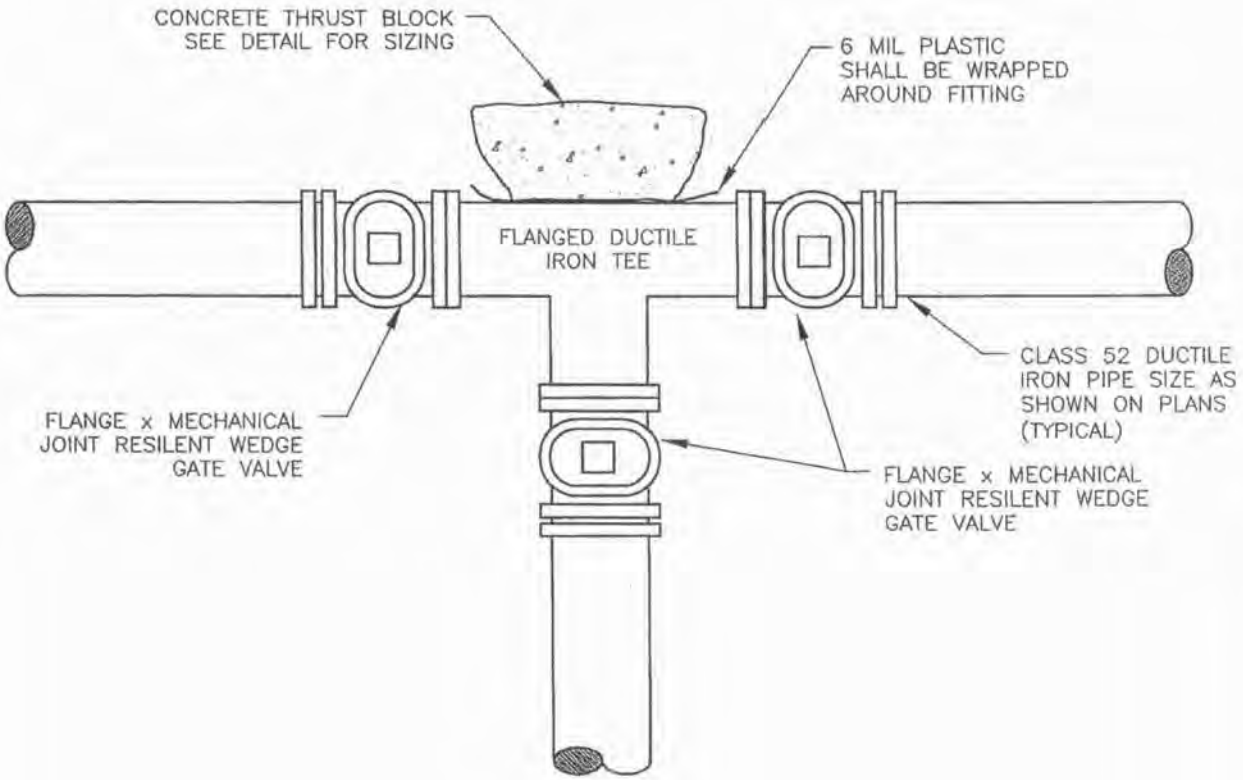
James P. Carothers 5-8-07

DETAIL APPROVED BY DATE

NO SCALE

DETAIL NO. W12

WTR-RISER.DWG




NOTES:

1. VALVES TO BE INSTALLED AT ALL BRANCHES. FOR LONG MAIN LINE RUNS INLINE VALVE SPACING NOT TO EXCEED 500'. LOOP WATER SYSTEM WHEREVER POSSIBLE. KEEP DEAD ENDS TO A MINIMUM.
2. MECHANICAL THRUST RESTRAINT MAY BE USED DUE TO UNSTABLE SOILS OR THE ENGINEER'S DISCRETION

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 5/1/07 | SD | JH |
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| | | | |

CITY OF CAMAS ~ WATER DETAIL

WATER MAIN LINE AND VALVE

James E. Scott Hein 5-8-07

DETAIL APPROVED BY DATE

NO SCALE

DETAIL NO. W13

WTR-VALVE.DWG

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 7/17/06 | RES1071 | COUNCIL |
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CITY OF CAMAS ~ WATER DETAIL

# PIPE JOINT RESTRAINT

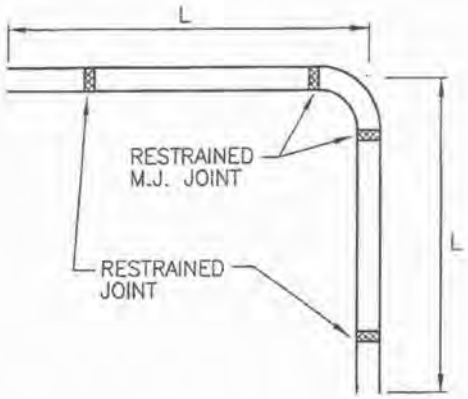
DETAIL APPROVED BY

DATE 5-8-07

NO SCALE

DETAIL NO. W14

FOR HORIZONTAL BENDS:




## MINIMUM REQUIRED PIPE LENGTHS FOR RESTRAINED JOINTS

| BEND IN DEGREES | PIPE DIAMETER 6" | 8" | 10" | 12" |
|---|---|---|---|---|
| 90 | 25' | 33' | 39' | 45' |
| 45 | 10' | 13' | 16' | 19' |
| 22 1/2 | 5' | 6' | 8' | 9' |
| 11 1/2 | 3' | 3' | 4' | 4' |

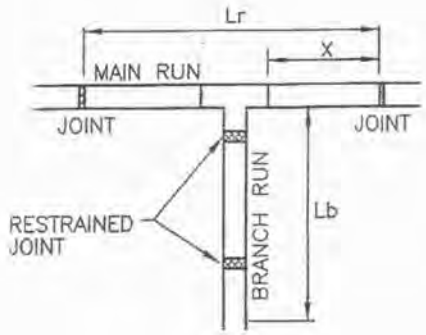
NOTE: CHART USES WORKING PRESSURE OF 200 PSI

FOR PRESSURES OTHER THAN 200 PSI USE:

$$\frac{(L) \times (\text{PRESSURE})}{200}$$

NOTE: FIELD-LOCK GASKETS ARE APPROVED FOR RESTRAINED JOINT INSTALLATION.

TEES:




## MINIMUM REQUIRED PIPE LENGTHS FOR RESTRAINED JOINTS

FOR 6" TEES USE FORMULA
Lb=50 − 1.63 (Lr)

WHERE:
Lb= THE MINIMUM REQUIRED RESTRAINED PIPE (IN FEET) ON THE BRANCH LINE
Lr= THE TOTAL LENGTH (IN FEET) BETWEEN THE FIRST JOINTS ON EITHER SIDE OF THE TEE ON THE MAIN RUN.

NOTE: CONDITIONS TO BE FIELD VERIFIED BY ENGINEER.

IF (X) IS LESS THAN 5 FEET THEN PIPE MUST BE RESTRAINED TWO FULL LENGTHS.

FOR 8" TEE USE FORMULA
Lb=64 − 1.65(Lr)

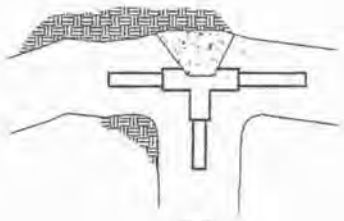
FOR 12" TEE USE FORMULA
Lb=90 −1.67(Lr)

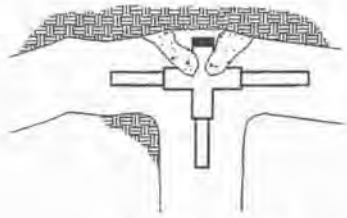


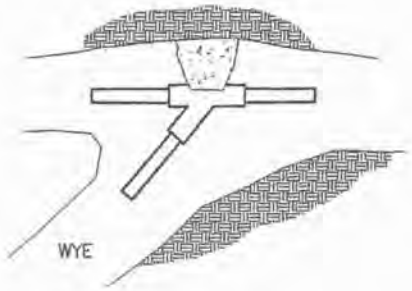
WTR-JOINT.DWG

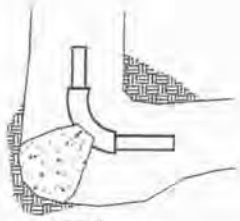
| FITTING SIZE | TEE, WYE, PLUG OR CAP | 90° BEND PLUGGED CROSS | TEE PLUGGED ON RUN | | 45° BEND | 22 1/2° BEND | 11 1/2° BEND |
|---|---|---|---|---|---|---|---|
| | | | A1 | A2 | | | |
| 4 | 1.0 | 1.4 | 1.9 | 1.4 | 1.0 | -- | -- |
| 6 | 2.1 | 3.0 | 4.3 | 3.0 | 1.6 | 1.0 | -- |
| 8 | 3.8 | 5.3 | 7.6 | 5.4 | 2.9 | 1.5 | 1.0 |
| 10 | 5.9 | 8.4 | 11.8 | 8.4 | 4.6 | 2.4 | 1.2 |
| 12 | 8.5 | 12.0 | 17.0 | 12.0 | 6.6 | 3.4 | 1.7 |
| 14 | 11.5 | 16.3 | 23.0 | 16.3 | 8.9 | 4.6 | 2.3 |
| 16 | 15.0 | 21.3 | 30.0 | 21.3 | 11.6 | 6.0 | 3.0 |
| 18 | 19.0 | 27.0 | 38.0 | 27.0 | 14.6 | 7.6 | 3.8 |
| 20 | 23.5 | 33.3 | 47.0 | 33.3 | 18.1 | 9.4 | 4.7 |
| 24 | 34.0 | 48.0 | 68.0 | 48.0 | 26.2 | 13.6 | 6.8 |

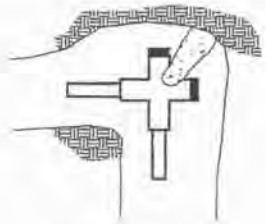
NOTES:
1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH
2. KEEP CONCRETE CLEAR OF JOINTS AND ACCESSORIES.
3. THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLANS. e.g. (15) INDICATES 15 SQUARE FEET BEARING AREA REQUIRED.
4. IF NOT SHOWN ON PLANS REQUIRED BEARING AREAS AT FITTINGS SHALL BE AS INDICATED BELOW, ADJUSTED IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWED SOIL BEARING STRESS(ES) STATED IN THE SPECIAL SPECIFICATIONS.
5. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS. TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAILS.
6. ALL FITTINGS SHALL BE WRAPPED IN 6 MIL PLASTIC PRIOR TO THRUST BLOCK PLACEMENT. MAKING SURE THE BOLTS AND NUTS ARE PROTECTED.
7. THRUST BLOCKS SHALL BE GIVEN 72 HOURS TO SET UP PRIOR TO PRESSURIZING LINE OR AS DIRECTED BY CITY INSPECTOR.


TEE

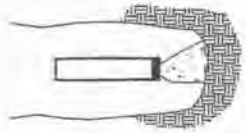

PLUGGED CROSS


WYE


BEND


PLUGGED CROSS


PLUGGED TEE


PLUG OR CAP

NOTES:
ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 LBS. PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSESM USE THE FOLLOWING EQUATION:
BEARING AREA= (TEST PRESSURE/150)x(2000/SOIL BEARING STRESS)x(TABLE VALUE)

EACH AREA IS 1/2 OF REQUIRED TOTAL AREA

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CITY OF CAMAS ~ WATER DETAIL

THRUST BLOCK DETAIL

DETAIL APPROVED BY

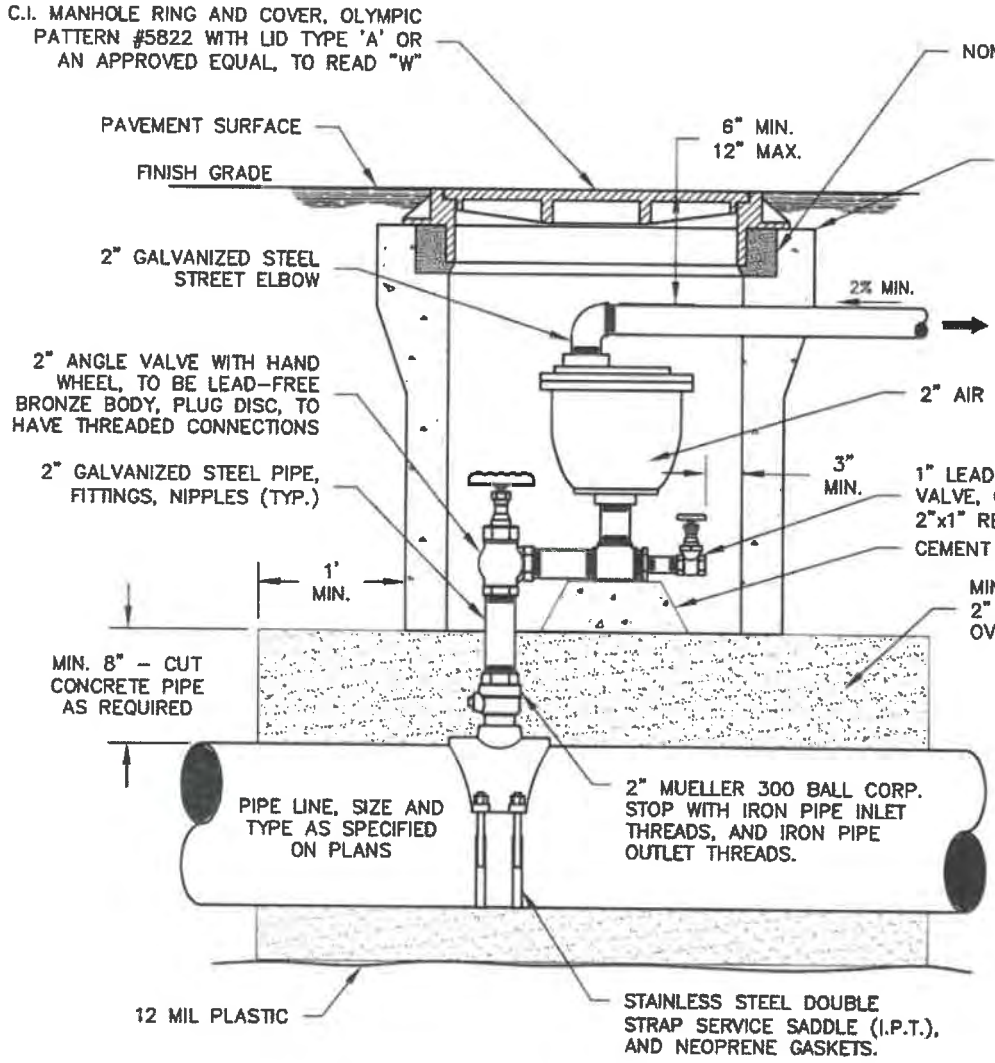
5-8-07
DATE

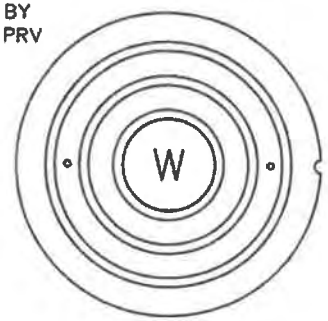
NO SCALE

DETAIL NO. W15



WTR-THRUST.DWG




WATER COVER

NOTES:

1. THIS INSTALLATION ONLY TO BE USED AT HIGH-POINT DEAD END ROADS WHERE THE MAIN WILL BE EXTENDED IN THE FUTURE.
2. CORPORATION STOP, ANGLE VALVE, AND CONNECTING PIPE SHALL BE THE SAME DIAMETER AS THE AIR INLET.
3. USE APPROVED JOINTING COMPOUND ON ALL THREADED CONNECTIONS.
4. ROTATE AIR/VACUUM VALVE TO PROVIDE MAXIMUM CLEARENCE FOR ACCESS TO ANGLE VALVE.
5. AIR/VACUUM VALVE TO BE EQUAL TO APCO HEAVY DUTY COMBINATION AIR RELEASE VALVE, MODEL #145C.
6. ALL PIPE SHALL BE SCHEDULE 40 GALV. STEEL PIPE CONFORMING TO ASTM A 120.
7. DETAILS SHOWN ON THE PLANS TAKE PRECEDENCE OVER THIS STANDARD DETAIL.
8. AIR/VAC ASSEMBLY MAY BE LOCATED ADJACENT TO MAIN LOCATION AT THE DISCRETION OF ENGINEER.

City of Camas WASHINGTON

WATER DETAIL

2" AIR/VACUUM RELEASE VALVE

6-17-19

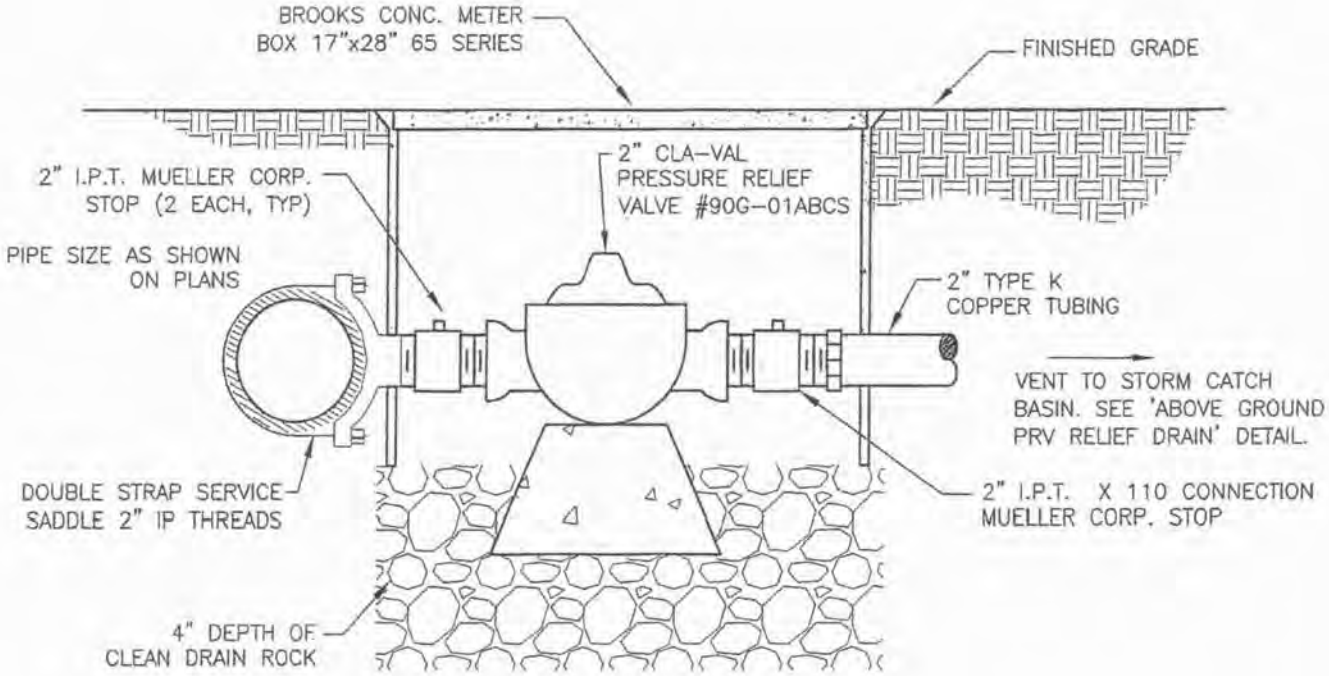
DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. W16

REVISION: 6 DATE: 6/3/2019

WTR-2VACVLV 2018.DWG




| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 5/1/07 | SD | JC |

CITY OF CAMAS - WATER DETAIL

2" PRESSURE RELIEF VALVE ASSEMBLY

DETAIL APPROVED BY

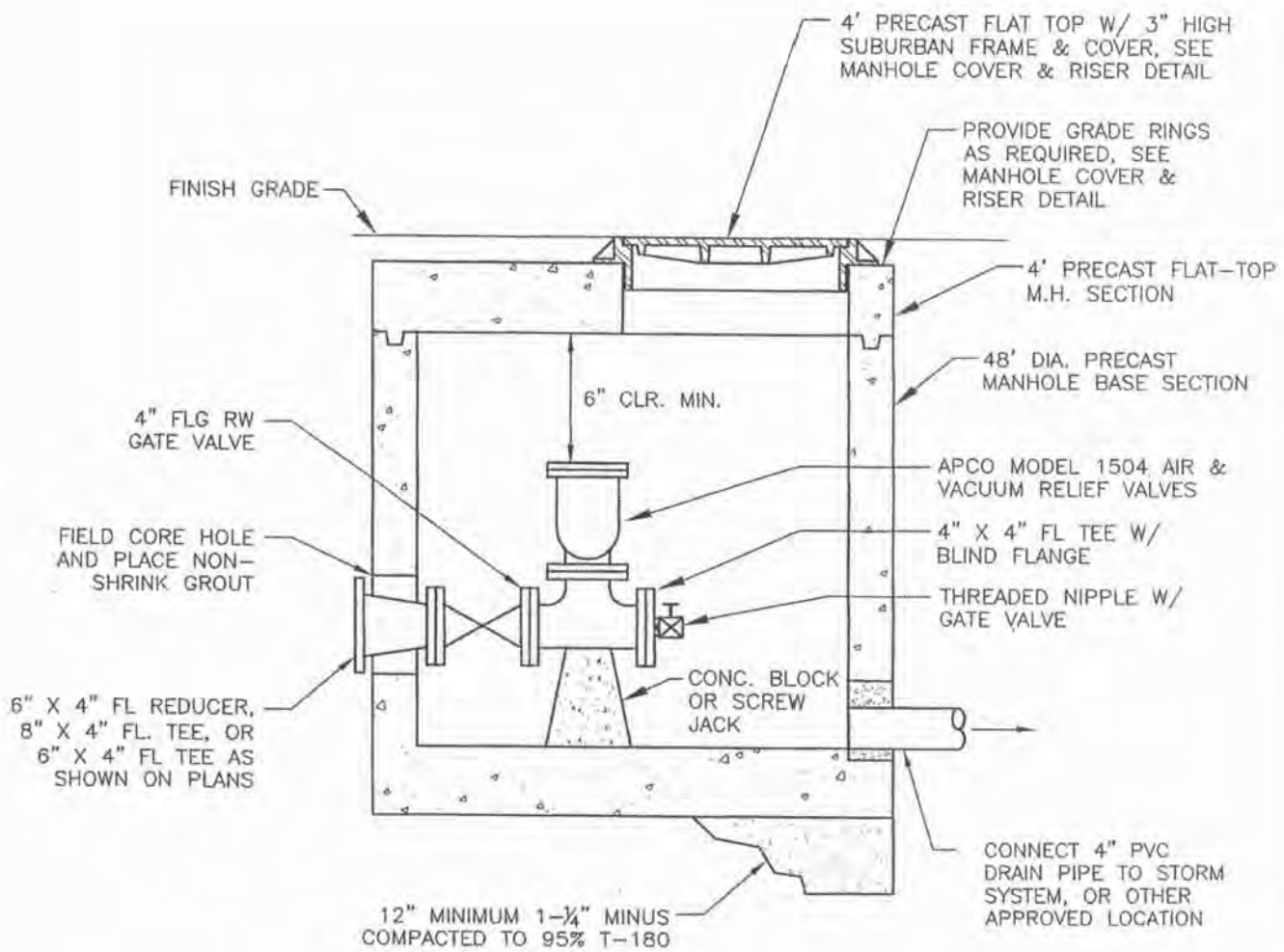
5-8-07
DATE

NO SCALE

DETAIL NO. W17



2PRV.DWG




NOTES:

1. MANHOLE SHALL CONFORM TO ASTM C-478.
2. MASTIC SEAL REQUIRED ON ALL KEYLOCK JOINTS.
3. VAULT SHALL BE SET FOR 1% SLOPE TO DRAIN.
4. ALL BACKFILL SHALL BE APPROVED GRANULAR MATERIAL.
5. SUMP PUMP MAY BE REQUIRED ON INSTALLATIONS WHERE DRAIN PIPE CANNOT BE CONNECTED TO ADEQUATE STORM DRAIN SYSTEM. THE APPROVED SUMP PUMP SHALL BE A COMMERCIAL GRADE WATER POWERED VENTURI DESIGN WITH BACKFLOW PREVENTION, SIZED TO PROVIDE 10GPM AT 10 FEET OF HEAD AT THE AVAILABLE SYSTEM WATER PRESSURE. BACKFLOW DEVICE SHALL BE CERTIFIED BY WASHINGTON STATE CERTIFIED BACKFLOW TESTER AFTER INSTALLATION AND PRIOR TO ACCEPTANCE. TEST RESULTS SHALL BE SENT TO CITY OF CAMAS WATER DEPARTMENT.

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|---|---|---|---|
| 1 | 5/1/07 | SD | JC |
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CITY OF CAMAS - WATER DETAIL

4" VACUUM RELIEF VALVE

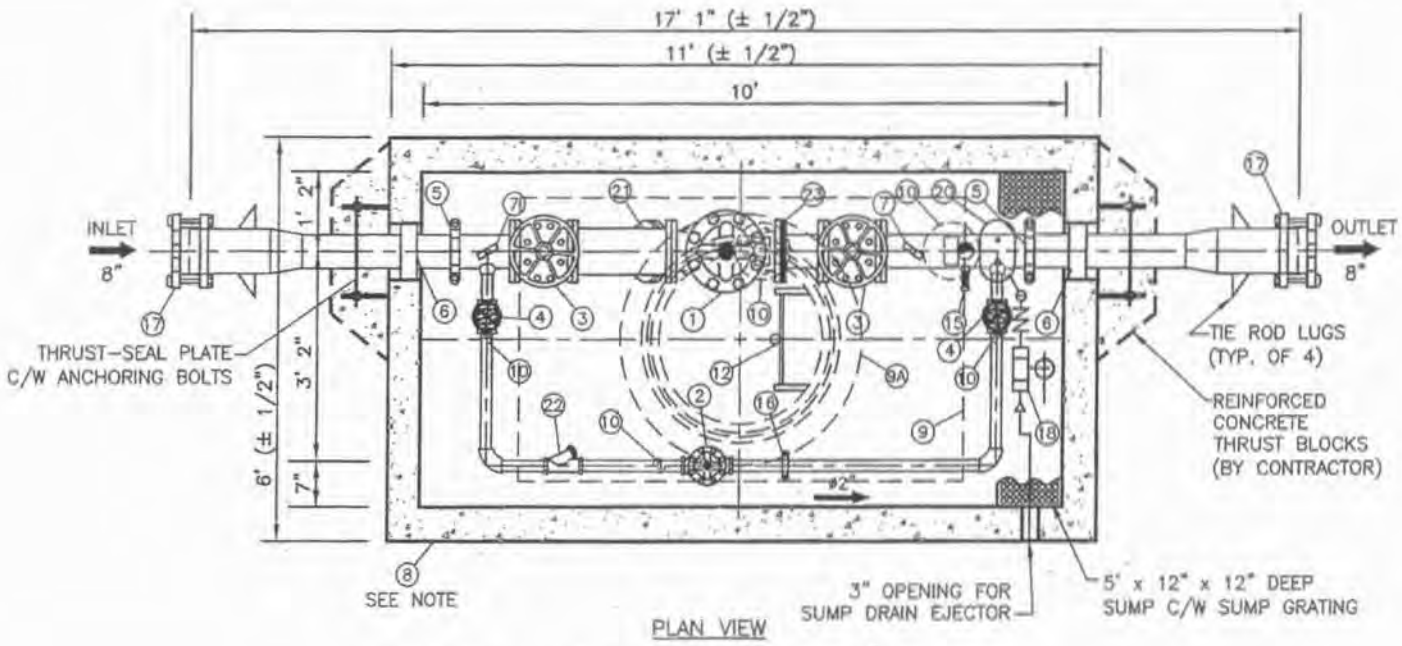
Jason E. Carothers 5-8-07

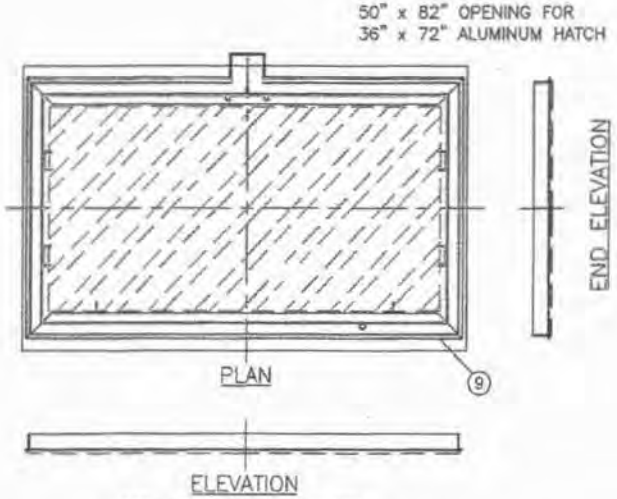
DETAIL APPROVED BY DATE

NO SCALE

DETAIL NO. W18

WT4-4ARV.DWG




NOTES:
VAULT #10565 (H20 LOADING) INSIDE DIMENSIONS 10'LX5'WX6'6"H

STANDARD FABRICATION & FINISHING SPECIFICATION:
ALL 2" AND SMALLER PIPE TO BE THREADED BRASS. ALL 3" AND LARGER PIPE, INSIDE WETTED SURFACES TO BE SANDBLASTED, EPOXY LINED AND COATED TO AWWA C-210 AND NSF-61 SPECIFICATION. FINISH COATING WILL BE BLUE ENAMEL.

FABRICATED STEEL PIPE & FITTINGS TO BE SCHEDULE NO. 40 STEEL PIPE FOR SIZES TO 10" AND ⅜" WALL FOR 12" AND LARGER.

| REV. NO. | DATE | BY | APPR. |
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CITY OF CAMAS - WATER DETAIL

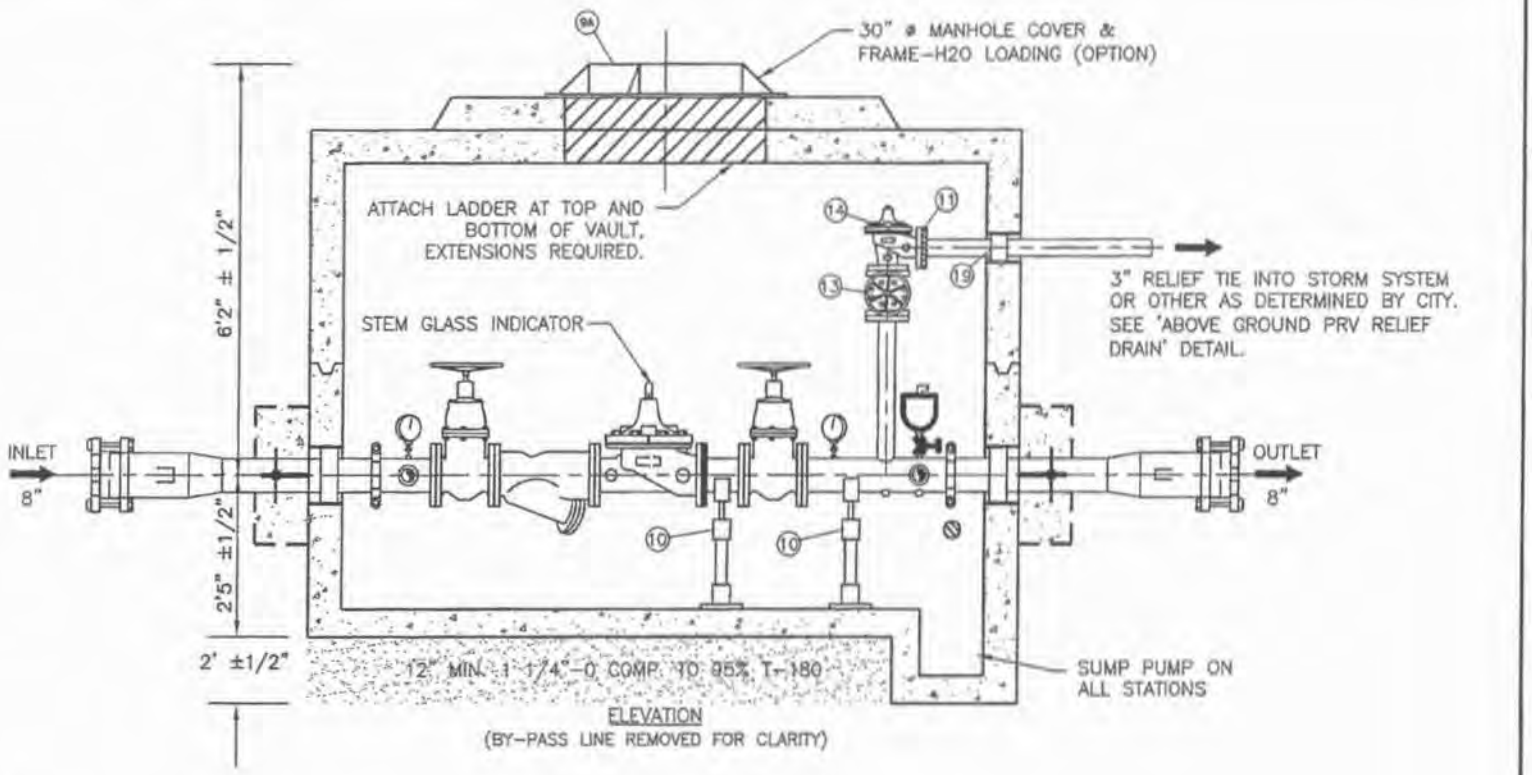
# 6"X2" PRV STATION W/ 3" RELIEF

DETAIL APPROVED BY: [signature] DATE: 5-8-07

NO SCALE

DETAIL NO. W19a

WTR-PRV3RELIEF.DWG




## MATERIALS

| ITEM | QTY. | DESCRIPTION |
|---|---|---|
| 1 | 1 | 6" CLA-VAL 90-01YBCS PRESSURE REDUCING VALVE |
| | | C/W X 101 POSITION INDICATOR, DIBT-#150 FLG (15-75PSI) |
| 2 | 1 | 2" CLA-VAL 90-01YBCS PRESSURE REDUCING VALVE |
| | | C/W X 101 POSITION INDICATOR, DIBT-THREADED (15-75 PSI) |
| 3 | 2 | 6" MUELLER A2360-6W41 NRS GATE VALVE C/W HANDWHEEL -#125 FLGD |
| 4 | 2 | 2" MUELLER A2360-8 RW NRS GATE VALVE C/W HANDWHEEL-THREADED |
| 5 | 2 | 6" VICTAULIC #07 COUPLING |
| 6 | 2 | 6" PIPE SEAL ASSEMBLY |
| 7 | 2 | 4" WIKA (0-200PSI) PRESSURE GAUGE C/W GAUGE COCK |
| 8 | 1 | #10565 PRECAST CONCRETE VAULT C/W WHITE INTERIOR, BLACK EXTERIOR |
| 9 | 1 | 36"x72" ALUMINUM HATCH W/ SPRING ASSIST |
| 10 | 5 | ADJUSTABLE PIPE SUPPORTS |
| 11 | 1 | 3" VICTAULIC #741 FLANGE ADAPTER ADAPTOR |

| ITEM | QTY. | DESCRIPTION |
|---|---|---|
| 12 | 1 | ALUMINUM LADDER WITH LADDER-UP ASSEMBLY |
| 13 | 1 | 3" MUELLER A2360-6W41 NRS GATE VALVE C/W |
| | | HANDWHEEL-#125 FLGD. |
| 14 | 1 | 3" CLA-VAL 50A-01B PRESSURE RELIEF VALVE |
| | | C/W DIBT-150# FLG (20-200 PSI) |
| 15 | 1 | 3/4" HOSE BIB ASSEMBLY |
| 16 | 1 | 2" VICTAULIC #07 COUPLING |
| 17 | 1 | 8" SMITH BLAIR ST X DI TRANSITION COUPLING |
| 18 | 1 | SUMP DRAIN INJECTOR |
| 19 | 1 | 3" PIPE SEAL ASSEMBLY |
| 20 | 1 | 1" APCO 143C.1 COMB. A.R.V. C/W ISOLATION VALVE |
| 21 | 1 | 6" MUELLER 758 Y-STRAINER - #125 FLGD |
| 22 | 1 | 2" MUELLER 35' Y-STRAINER - THD |
| 23 | 1 | 6" VICTAULIC #741 FLANGE ADAPTOR |

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 5/1/07 | SD | JC |

CITY OF CAMAS - WATER DETAIL

# 6"X2" PRV STATION W/ 3" RELIEF

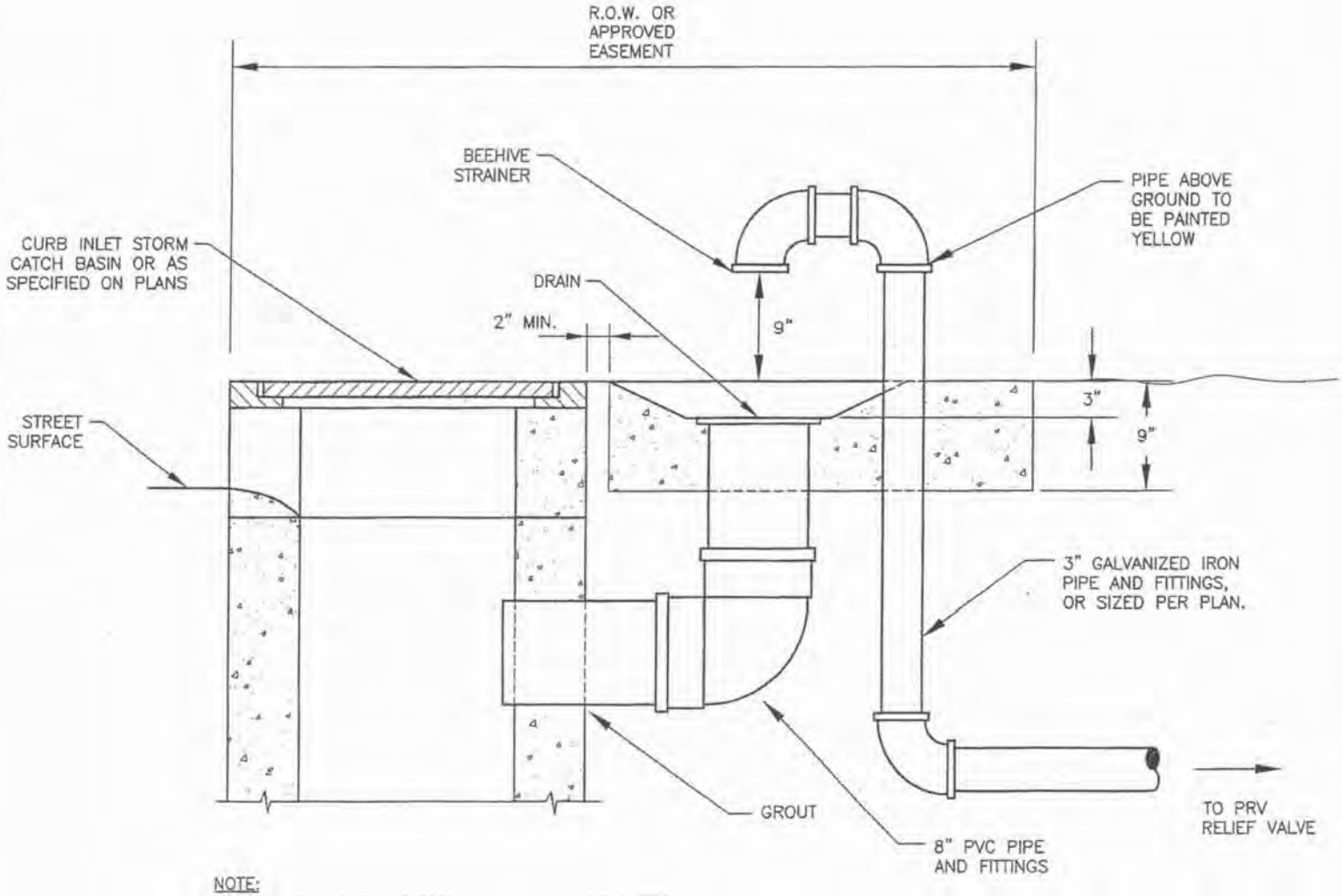
DETAIL APPROVED BY: Jeff Gaither 5-8-07 DATE

NO SCALE

DETAIL NO. W19b



WTR-PRV3RELIEF.DWG




NOTE:
1. IF CATCH BASIN IS NOT AVAILABLE, A DEDICATED STORM LATERAL MAY BE REQUIRED.

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 5/1/06 | SD | JC |

CITY OF CAMAS ~ WATER DETAIL

ABOVE GROUND PRV RELIEF DRAIN

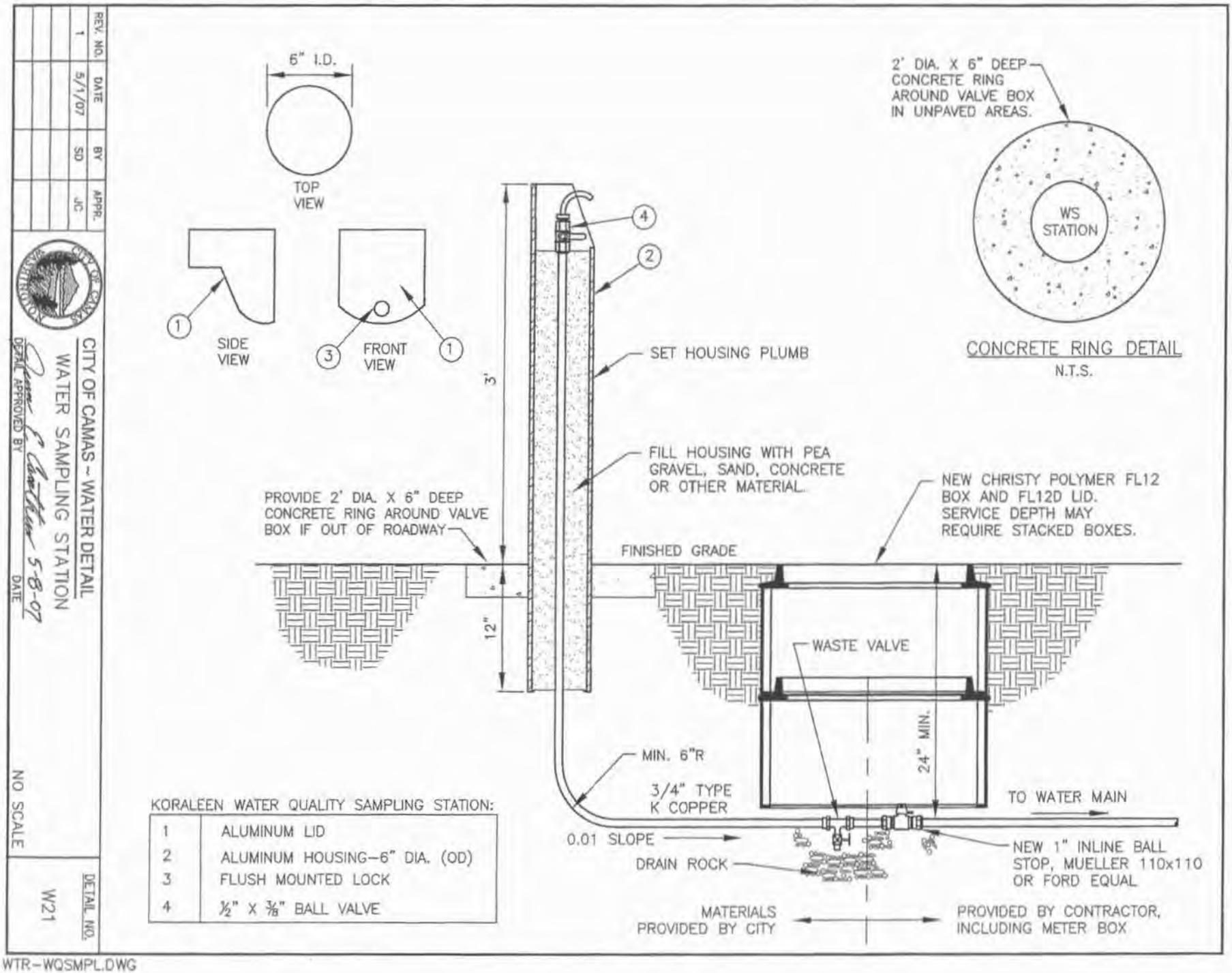
DETAIL APPROVED BY

5-8-07
DATE

NO SCALE

DETAIL NO. W20

WTR-RELIEFDRN.DWG




KORALEEN WATER QUALITY SAMPLING STATION:

| | |
|---|---|
| 1 | ALUMINUM LID |
| 2 | ALUMINUM HOUSING–6" DIA. (OD) |
| 3 | FLUSH MOUNTED LOCK |
| 4 | ½" X ⅜" BALL VALVE |

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 5/1/07 | SD | JC |

CITY OF CAMAS – WATER DETAIL

WATER SAMPLING STATION

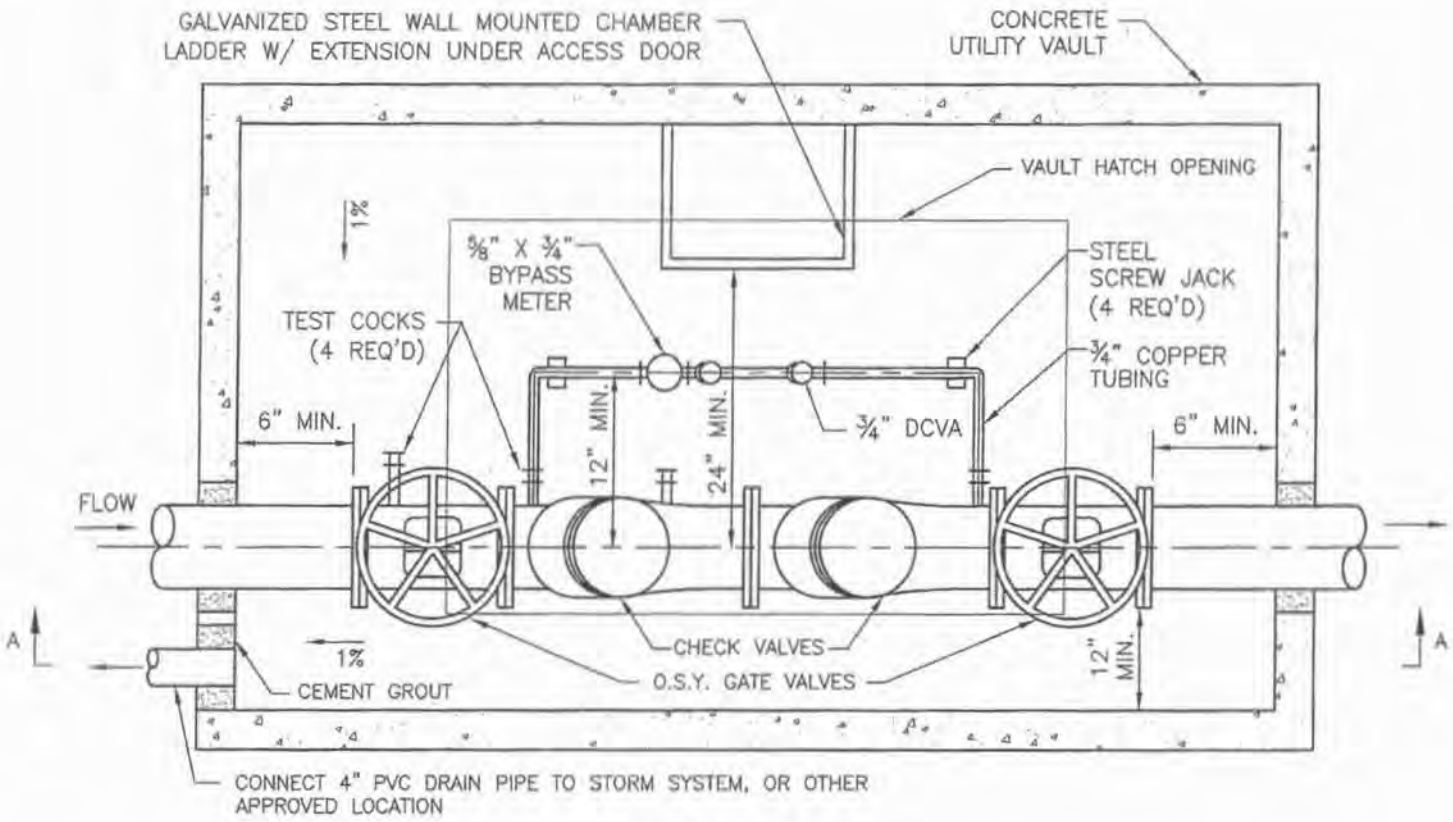
DETAIL APPROVED BY: Steven C. Hamilton 5-8-07 DATE

NO SCALE

DETAIL NO. W21



WTR-WQSMPL.DWG




## PLAN VIEW

DOUBLE CHECK DETECTOR VALVE ASSY. NOTES:

1. APPROVED DOUBLE CHECK DETECTOR VALVE ASSEMBLY TO LAY HORIZONTAL WITH THE GROUND, SHALL BE INSTALLED ON FIRE PROTECTION SYSTEMS WHEN CONNECTED TO POTABLE WATER SUPPLY. THE ASSEMBLY SHALL BE A COMPLETE ASSEMBLY INCUDING UL LISTED RESILIENT SEATED OSY SHUTOFF VALVES AND TEST COCKS. THE UNIT SHALL BE UL/FM APPROVED WITH UL/FM APPROVED OSY SHUTOFF VALVES. THE AUXILIARY LINE SHALL CONSIST OF AN APPROVED BACKFLOW PREVENTER AND WATER METER. THE ASSEMBLY SHALL MEET THE BASIC REQUIREMENTS OF ASSE 1048; AWWA STD. C510 FOR DOUBLE CHECK VALVES, AND BE APPROVED BY THE FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH AT THE UNIVERSITY OF SOUTHERN CALIFORNIA.
2. SYSTEM SHALL BE DESIGNED FOR BACK SIPHONAGE AND BACK PRESSURE.
5. THE WATER LINE SHALL BE DISINFECTED, FLUSHED, AND PRESSURE TESTED PRIOR TO INSTALLING THE BACKFLOW ASSEMBLY. THE BACKFLOW ASSEMBLY SHALL BE PROTECTED FROM FREEZING AND FLOODING.
4. ALL PIPE, VALVE, AND FITTING JOINTS FROM THE SUPPLY MAIN SHALL BE FLANGED AND RESTRAINED. MINIMUM COVER 30". GROUT PIPE ENTRANCE AND EXIT IN VAULT WITH WATER TIGHT GROUT.
5. THE BACKFLOW ASSEMBLY SHALL BE TESTED AFTER INSTALLATION AND PRIOR TO ACCEPTANCE AND ALSO YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW TESTER. TEST RESULTS SHALL BE SENT TO THE CITY OF CAMAS WATER DEPARTMENT.
6. ALL BACKFILL SHALL BE APPROVED GRANULAR MATERIAL.

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 5/1/07 | SD | JC |

CITY OF CAMAS ~ WATER DETAIL

STANDARD DOUBLE CHECK DETECTOR VALVE ASSY.

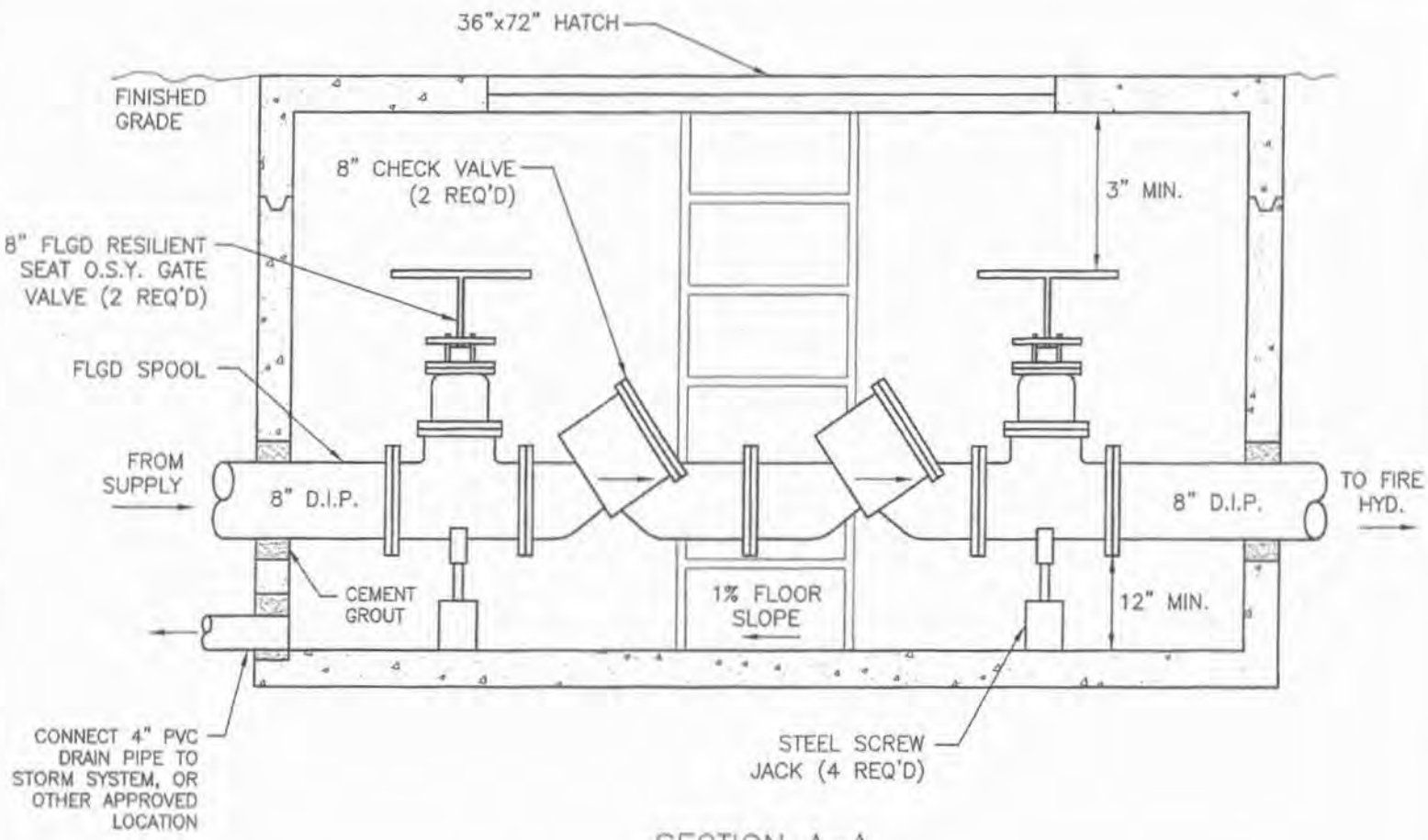
DETAIL APPROVED BY: [signature] DATE: 5-3-07

NO SCALE

DETAIL NO. W22a



WTR-DCDVA.DWG




## SECTION A–A

VAULT CONSTRUCTION NOTES:

1. VAULT SHALL BE PRE-APPROVED PRIOR TO INSTALLATION.
2. VAULT SHALL BE INSTALLED AT PROPERTY LINE OR EASEMENT LINE AND ON OWNERS PROPERTY.
3. VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL STRUCTURES.
4. APPROVED VAULT SHALL BE RATED FOR H20 LOADING AND INCLUDE AN EXTENSION LADDER, MINIMUM INSIDE DIMENSIONS 8'Lx5'Wx6'H.
5. VAULT SHALL BE SET FOR 1% SLOPE TO DRAIN.
6. ALL BACKFILL SHALL BE APPROVED GRANULAR MATERIAL.
7. HATCH SHALL BE AN H20 RATED, 36"x72" SPRING ASSISTED, HOT DIPPED GALVANIZED DIAMOND PLATE DOUBLE DOOR. FOR TRAFFIC INSTALLATIONS A 30" MANHOLE LID SHALL BE USED INSTEAD OF A HATCH.
8. SUMP PUMP MAY BE REQUIRED ON INSTALLATIONS WHERE DRAIN PIPE CANNOT BE CONNECTED TO ADEQUATE STORM DRAIN SYSTEM. THE APPROVED SUMP PUMP SHALL BE A COMMERCIAL GRADE WATER POWERED VENTURI DESIGN WITH BACKFLOW PREVENTION, SIZED TO PROVIDE 10GPM AT 10 FEET OF HEAD AT THE AVAILABLE SYSTEM WATER PRESSURE. BACKFLOW DEVICE SHALL BE CERTIFIED BY WASHINGTON STATE CERTIFIED BACKFLOW TESTER AFTER INSTALLATION AND PRIOR TO ACCEPTANCE. TEST RESULTS SHALL BE SENT TO CITY OF CAMAS WATER DEPARTMENT.

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 5/1/07 | SD | JC |

CITY OF CAMAS - WATER DETAIL

STANDARD DOUBLE CHECK DETECTOR VALVE ASSY.

DETAIL APPROVED BY: [signature] DATE: 5-3-07

NO SCALE

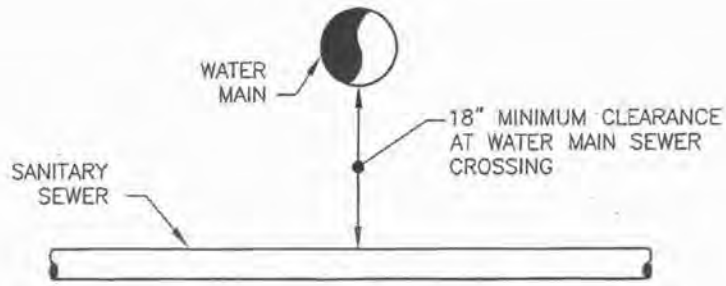
DETAIL NO. W22b



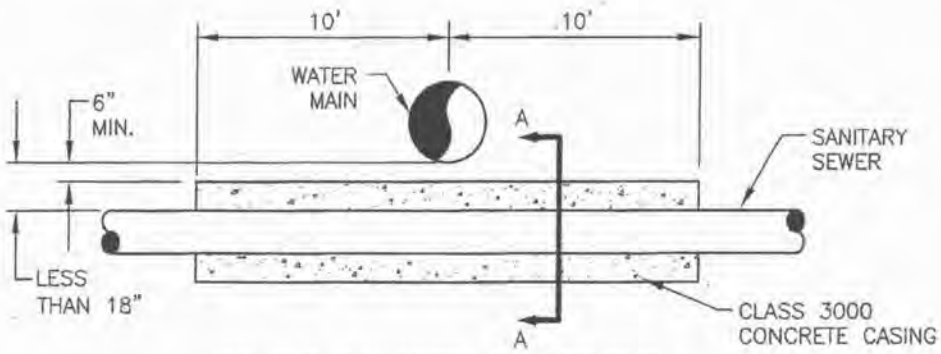
WTR-DCDVA.DWG

NOTE:

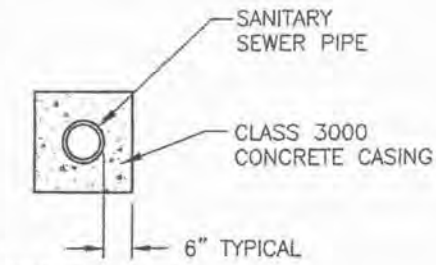
1. IF VERTICAL CLEARANCE IS LESS THAN 18", THE SEWER PIPE SHALL BE ENCASED. MINIMUM CLEARANCE WITH CASING SHALL BE 6".
2. CASING SHALL BE A 20' LENGTH OF CLASS 200 P.V.C. WITH BOTH ENDS PLUGGED, OR 6" CLASS 3000 CEMENT CONCRETE AS SHOWN BELOW.
3. MINIMUM VERTICAL CLEARANCE FOR WATER–ENCASEMENT, WATER–STORM OR SANITARY–STORM CROSSINGS SHALL BE 6".



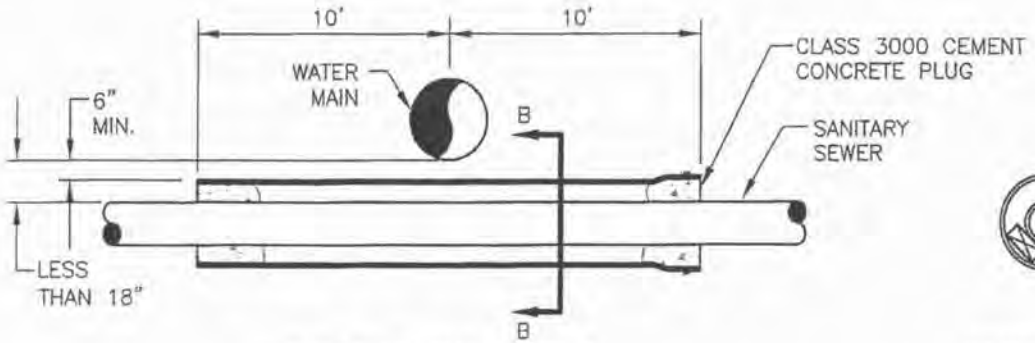

CROSSING WITHOUT ENCASEMENT



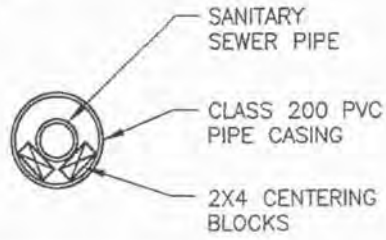

CEMENT CONCRETE ENCASEMENT




SECTION A–A




PVC PIPE ENCASEMENT




SECTION B–B

| REV. NO. | DATE | BY | APPR. |
|---|---|---|---|
| 1 | 5/1/07 | SD | JC |

CITY OF CAMAS ~ WATER DETAIL

UTILITY CROSSING DETAIL

DETAIL APPROVED BY

DATE 5-8-07

NO SCALE

DETAIL NO. W23

CROSSING.DWG

# APPENDIX L – 2018 WATER AUDIT

# AWWA Free Water Audit Software:
## Reporting Worksheet

WAS v5.0
American Water Works Association

? Click to access definition
+ Click to add a comment

**Water Audit Report for:** City of Camas (108002)
**Reporting Year:** 2018 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

**All volumes to be entered as: MILLION GALLONS (US) PER YEAR**

To select the correct data grading for each input, determine the highest grade where the

Master Meter and Supply Error Adjustments

### WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ----------> Pcnt: Value:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Volume from own sources: | + ? | 3 | 1,541.300 | MG/Yr | + ? | 8 | | | MG/Yr |
| Water imported: | + ? | n/a | 0.000 | MG/Yr | + ? | | | | MG/Yr |
| Water exported: | + ? | n/a | 0.000 | MG/Yr | + ? | | | | MG/Yr |

Enter negative % or value for under-registration
Enter positive % or value for over-registration

**WATER SUPPLIED:** 1,541.300 MG/Yr

### AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

| | | | | | Pcnt: | Value: | |
|---|---|---|---|---|---|---|---|
| Billed metered: | + ? | 5 | 1,346.122 | MG/Yr | | | |
| Billed unmetered: | + ? | n/a | 0.000 | MG/Yr | | | |
| Unbilled metered: | + ? | 7 | 0.603 | MG/Yr | | | |
| Unbilled unmetered: | + ? | 6 | 19.700 | MG/Yr | | 19.700 | MG/Yr |

Unbilled Unmetered volume entered is greater than the recommended default value

Use buttons to select percentage of water supplied **OR** value

**AUTHORIZED CONSUMPTION:** ? 1,366.425 MG/Yr

**WATER LOSSES (Water Supplied - Authorized Consumption)** 174.875 MG/Yr

**Apparent Losses**

| | | | | | Pcnt: | Value: | |
|---|---|---|---|---|---|---|---|
| Unauthorized consumption: | + ? | | 3.853 | MG/Yr | 0.25% | | MG/Yr |

**Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Customer metering inaccuracies: | + ? | 6 | 13.603 | MG/Yr | 1.00% | | MG/Yr |
| Systematic data handling errors: | + ? | 7 | 3.365 | MG/Yr | 0.25% | | MG/Yr |

**Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed**

**Apparent Losses:** ? 20.822 MG/Yr

**Real Losses (Current Annual Real Losses or CARL)**

**Real Losses = Water Losses - Apparent Losses:** ? 154.053 MG/Yr

**WATER LOSSES:** 174.875 MG/Yr

### NON-REVENUE WATER

**NON-REVENUE WATER:** ? 195.178 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

### SYSTEM DATA

| | | | | |
|---|---|---|---|---|
| Length of mains: | + ? | 7 | 170.2 | miles |
| Number of active AND inactive service connections: | + ? | 7 | 8,906 | |
| Service connection density: | ? | | 52 | conn./mile main |

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

**Average length of customer service line has been set to zero and a data grading score of 10 has been applied**

Average operating pressure: + ? 3 85.0 psi

### COST DATA

| | | | | | |
|---|---|---|---|---|---|
| Total annual cost of operating water system: | + ? | 10 | $3,306,489 | $/Year | |
| Customer retail unit cost (applied to Apparent Losses): | + ? | 9 | $5.76 | $/100 cubic feet (ccf) | |
| Variable production cost (applied to Real Losses): | + ? | 5 | $345.80 | $/Million gallons | ☐ Use Customer Retail Unit Cost to value real losses |

### WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 53 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

### PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Billed metered
3: Variable production cost (applied to Real Losses)

# AWWA Free Water Audit Software:
## System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.

Water Audit Report for: City of Camas (108002)

Reporting Year: 2018 | 1/2018 - 12/2018

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 53 out of 100 ***

### System Attributes:

| | | | |
|---|---|---|---|
| | Apparent Losses: | 20.822 | MG/Yr |
| + | Real Losses: | 154.053 | MG/Yr |
| = | Water Losses: | 174.875 | MG/Yr |
| ? | Unavoidable Annual Real Losses (UARL): | 70.01 | MG/Yr |
| | Annual cost of Apparent Losses: | $160,328 | |
| | Annual cost of Real Losses: | $53,272 | Valued at Variable Production Cost |

Return to Reporting Worksheet to change this assumpiton

### Performance Indicators:

| | | | |
|---|---|---|---|
| Financial: | Non-revenue water as percent by volume of Water Supplied: | 12.7% | |
| | Non-revenue water as percent by cost of operating system: | 6.7% | Real Losses valued at Variable Production Cost |
| Operational Efficiency: | Apparent Losses per service connection per day: | 6.41 | gallons/connection/day |
| | Real Losses per service connection per day: | 47.39 | gallons/connection/day |
| | Real Losses per length of main per day*: | N/A | |
| | Real Losses per service connection per day per psi pressure: | 0.56 | gallons/connection/day/psi |
| | From Above, Real Losses = Current Annual Real Losses (CARL): | 154.05 | million gallons/year |
| ? | Infrastructure Leakage Index (ILI) [CARL/UARL]: | 2.20 | |

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline