Water Reduction 101

in Portland, Oregon

Innovations in Irrigation

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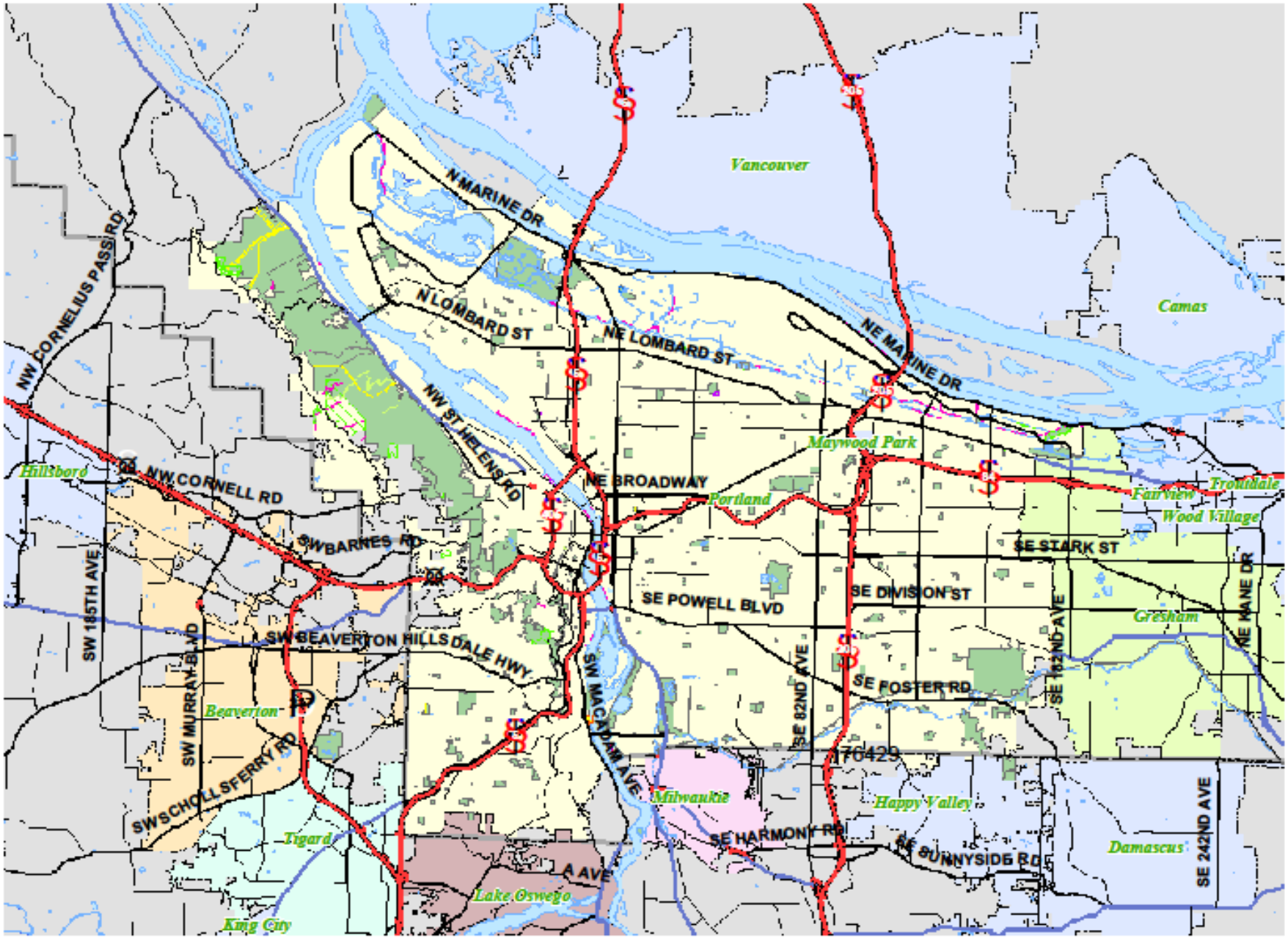
January 14th, 2011

Austin, Texas

PORTLAND
PARKS & RECREATION

Healthy Parks, Healthy Portland


Vancouver
N MARINE DR
NE MARINE DR
Camas
N LOMBARD ST
NE LOMBARD ST
NW CORNELIUS PASS RD
NW ST HELENS RD
Maywood Park
Hillsboro
NW CORNELL RD
NE BROADWAY
Portland
Fairview
Troutdale
Wood Village
SW BARNES RD
SE STARK ST
SW 185TH AVE
SE POWELL BLVD
SE DIVISION ST
Gresham
NE MAINE DR
SW BEAVERTON HILLSDALE HWY
SW MACADAM AVE
SE 82ND AVE
SE 162ND AVE
SE FOSTER RD
SW MURRAY BLVD
Beaverton
170429
SW SCHOLLS FERRY RD
Milwaukie
Happy Valley
SE 242ND AVE
Tigard
SE HARMONY RD
SE SUNNYSIDE RD
Damascus
A AVE
Lake Oswego
King City

Portland's International Rose Test Garden

- 10,000 + acres of Park Land
- 247 Park Sites
- AND……19,700 Rose Bushes

3,500 permits issued for picnics, weddings and other gatherings in our parks.

- 345 full-time employees
- 1,300 part-time employees
- 491,757 volunteer hours

1,452 acres of pp&r and pps turf mowed and maintained on a weekly schedule.

750 Irrigated Acres

150 Automatic Irrigation Systems

80 of those on Central Control

17 Wells, 700 Water Meters, 1000 Backflows

Waterfront Park

Renovation After a Park Event

Waterfront Park

Ready for the Next Event – in 2 Weeks!

DELTA PARK SPORTS COMPLEX

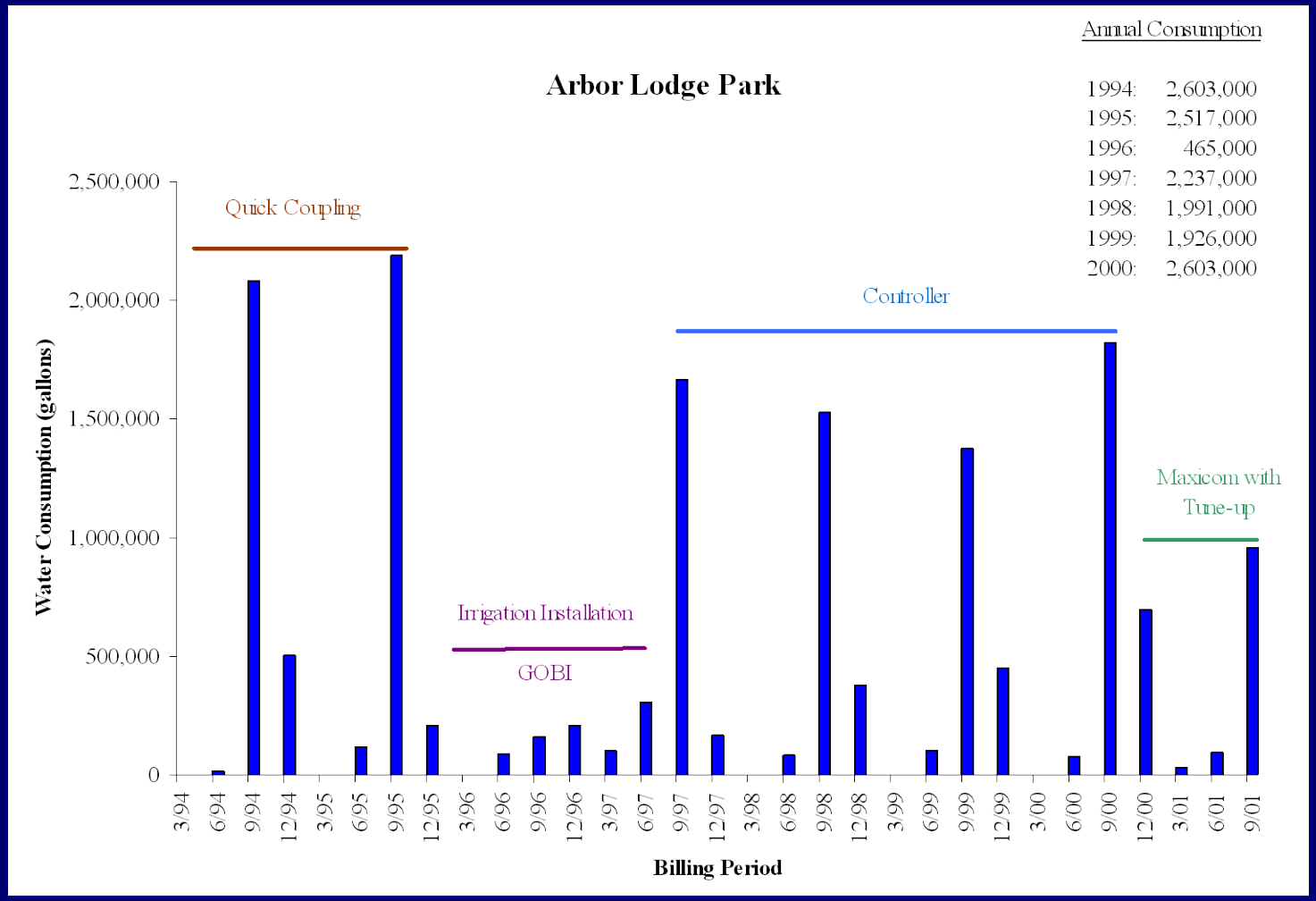
- **The entire delta sports complex**

History

Construction of Bull Run 1893

GOBI Years
’95 to 2000

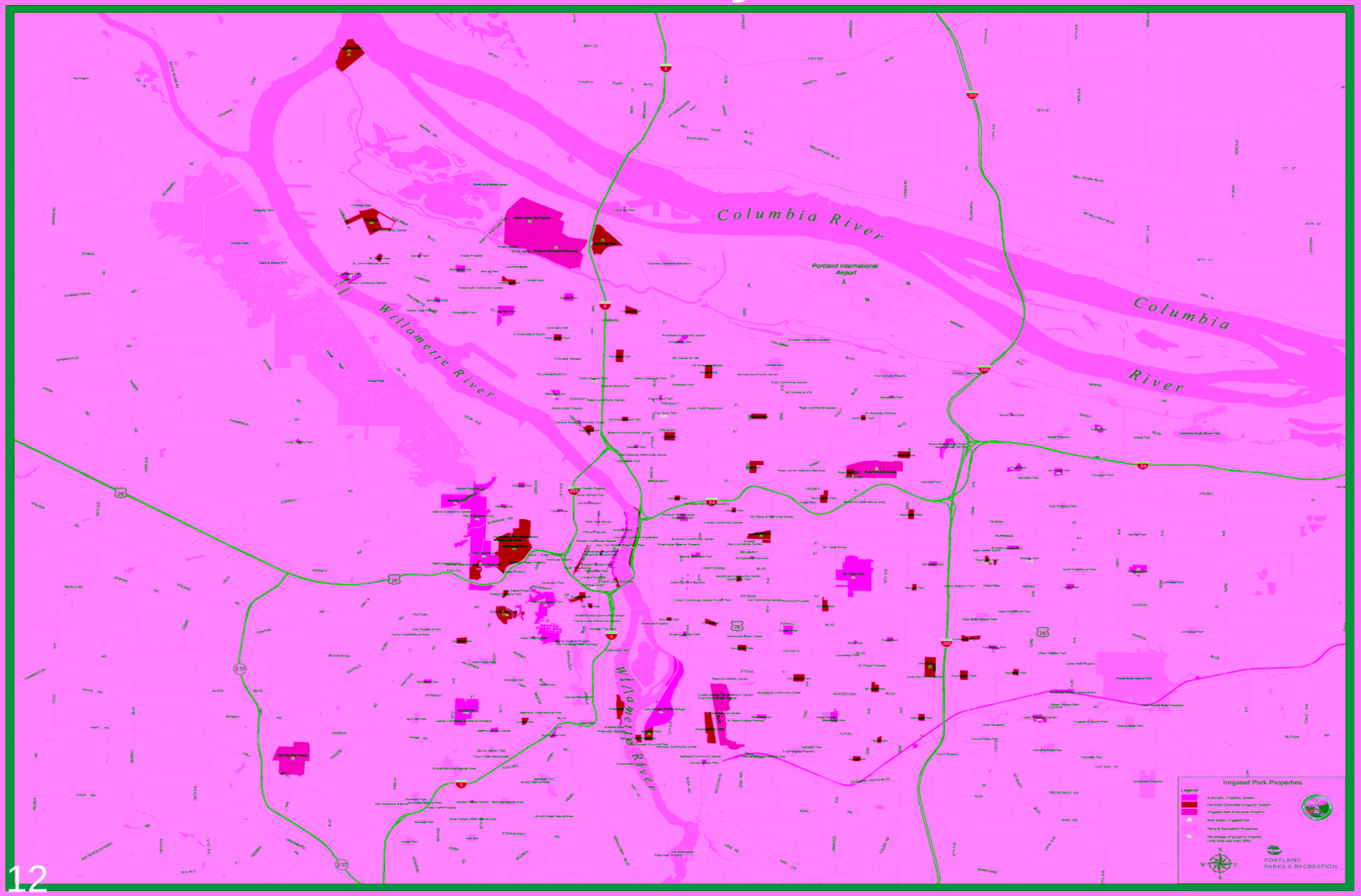
Water Use: From Quick Couplers to Central Control



WARNING

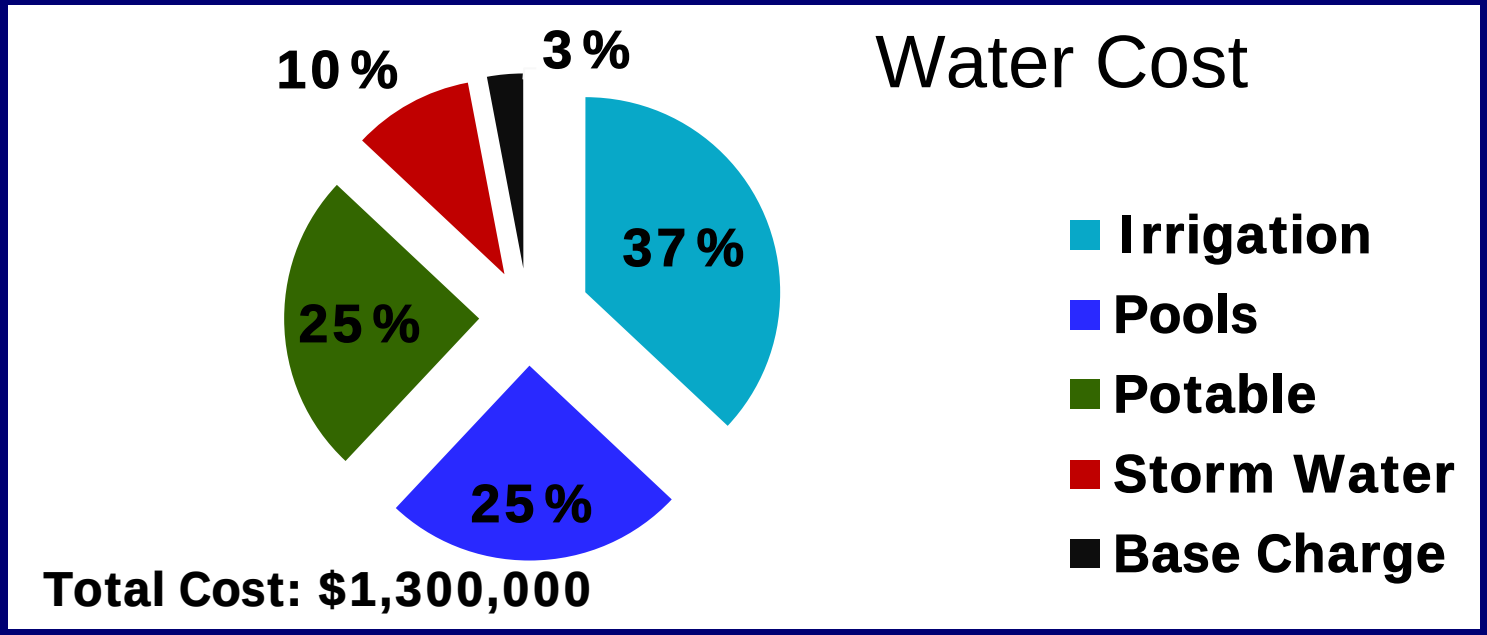
In 2003 PP&R was the first ever parks system to be certified for salmon friendly parks management by Salmon Safe, with that PP&R needed to develop an action plan that ensures that its staff has the knowledge to use water efficiently, without jeopardizing the integrity of its facilities and programs.

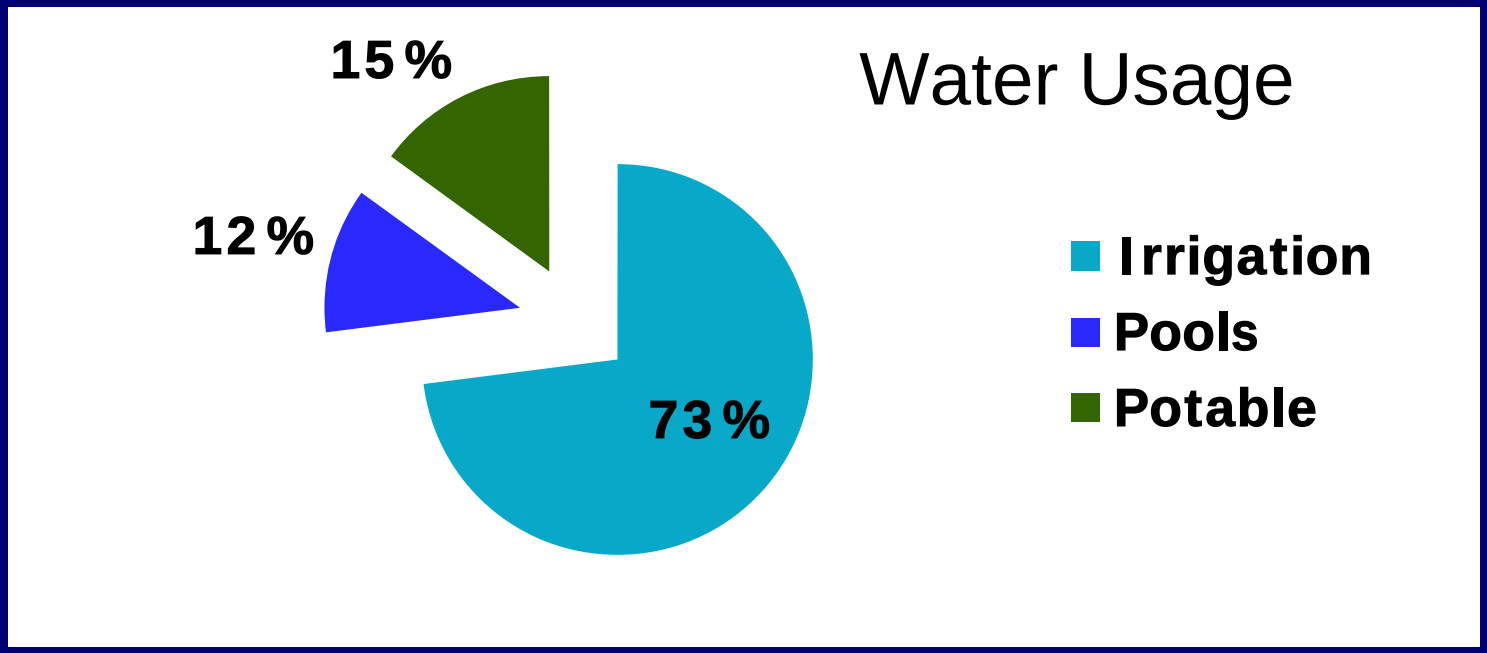
Parks are Categorized by Type of Irrigation Control System



Pittock Mansion

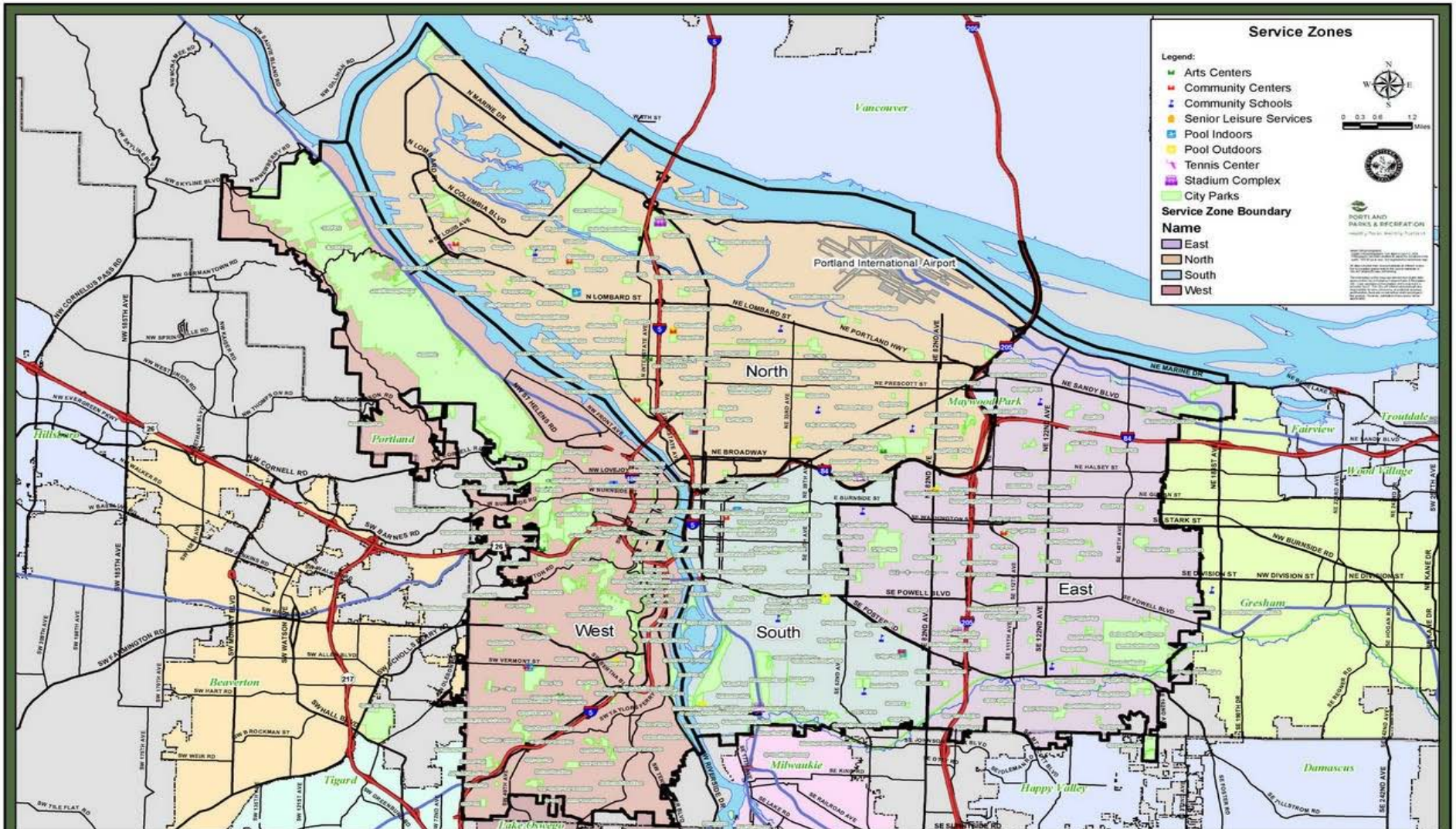
Parks Water Cost vs. Water Usage





Portland's Park System

Park Techs and Horticulturists are divided into 4 zones



Portland Parks Maintenance

The Troops on the Ground

The Irrigation team needed to motivate the techs to understand the value of irrigation systems tune-ups relationship to better turf quality & appearance

Park Technicians …….. **24**

Irrigation Specialists …… 5

The Idea:
An Audit Competition

The Parks Irrigation Services section organized an "Audit Competition" between the four Park Tech zones

The Goal:

Increase the Park Techs Awareness of Irrigation System Efficiency and how improvements can affect the quality and appearance of their parks

Audit Competition Format

4 Park Tech Zones - 4 Teams

Each Team choose a Sports Field to Improve

Simple Rules:

Pre-Audit Irrigation

Select Improvements

Make the Improvements

Post-Audit

Classroom Instruction with Industry Partners

Irrigation Auditor Training for team leaders

Basic Irrigation Training for all team members

Pre Audits

&

Tune-ups

Tune-ups: January - March

when time is available

Post Audits

Goal was a 20%
Overall improvement

Efficiency Results

	Pre DU_{lq}		Post DU_{lq}	% Improvement
Duniway Park	26.7	to	63.6	***138.2%***
Flavel Park	30.8	to	56.3	82.8%
Columbia Park	31.8	to	56.8	78.6%
Bloomington Park	39.5	to	49.0	24.1%

Improvements by Park

New Products

Nozzle Corrections

Head Placement / Alignment

PORTLAND
PARKS & RECREATION

Healthy Parks, Healthy Portland

PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

Water Reduction 202

in Portland, Oregon

Innovations in Irrigation

Gordon Kunkle, C.I.D, C.L.I.A, CIC, CLWM

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January 14th, 2011

Austin, Texas

PORTLAND
PARKS & RECREATION

Healthy Parks, Healthy Portland

Certified Water Conservation Manager™
CWCM
Landscape
IRRIGATION ASSOCIATION

EPA WaterSense PARTNER

Smart Water
APPLICATION TECHNOLOGIES®

WaterSense®

STMA
CERTIFIED
SPORTS FIELD MANAGER

WaterSense®

EPA WaterSense PARTNER

EPA WaterSense PARTNER

CERTIFIED IRRIGATION · DESIGNER

EPA WaterSense PARTNER

CERTIFIED LANDSCAPE · IRRIGATION · AUDITOR

EPA WaterSense PARTNER

CERTIFIED IRRIGATION · CONTRACTOR

CREATING AN INTERACTIVE CITY
GEOSPATIAL REVOLUTION

CIVICAPPS
FOR GREATER PORTLAND
Civic APPS

CivicAPPS

Planning & SUSTAINABILITY

Waterfront Park

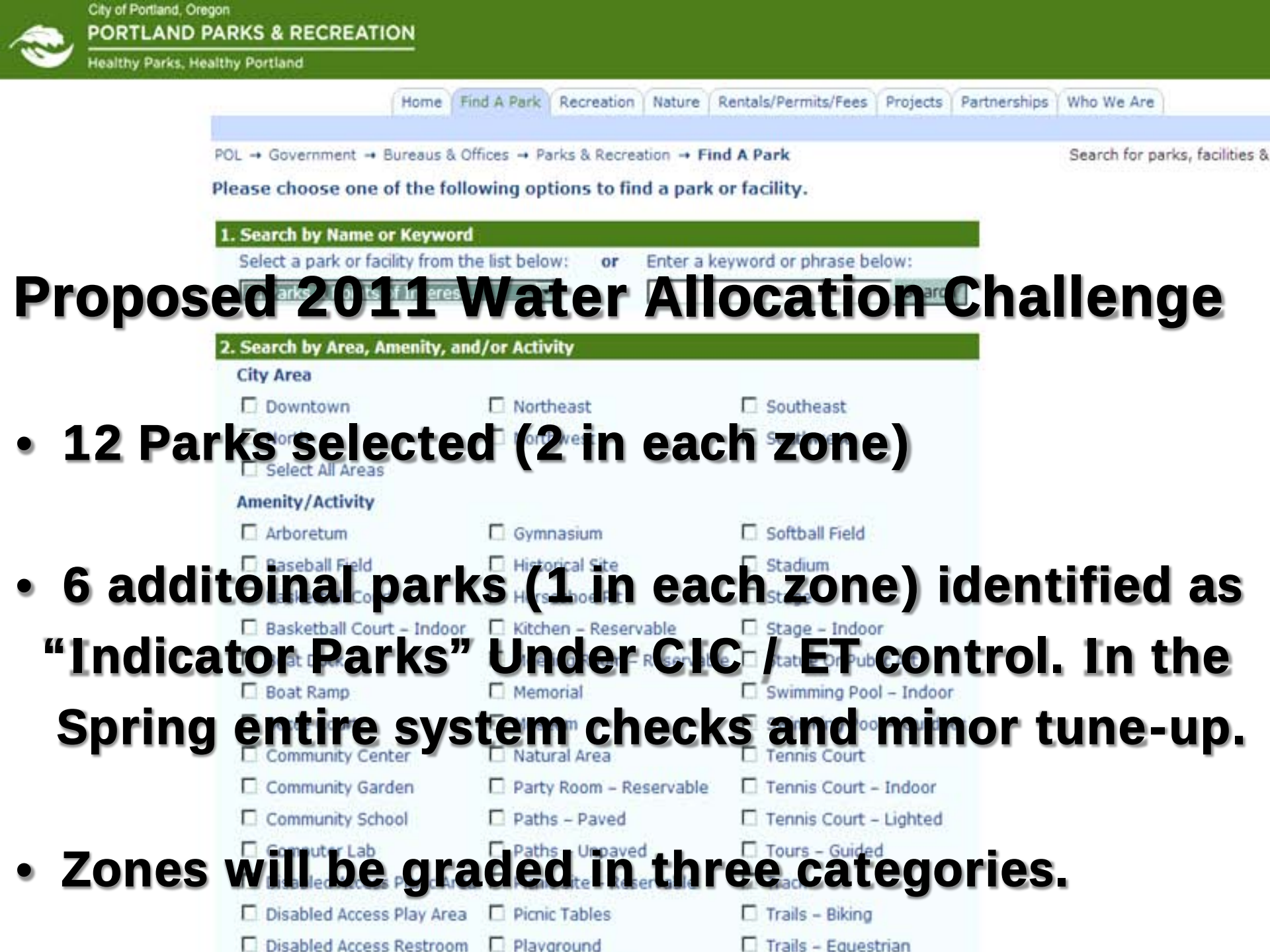
Google

http://geospatialrevolution.psu.edu/

Started with brainstorming various concepts to continue the challenge

Numerous ideas but bringing it down to something obtainable was the challenge

Developed a flow chart – seemed like a simple tasked – evolved to the realization that we had a lot of work to do in a short time.



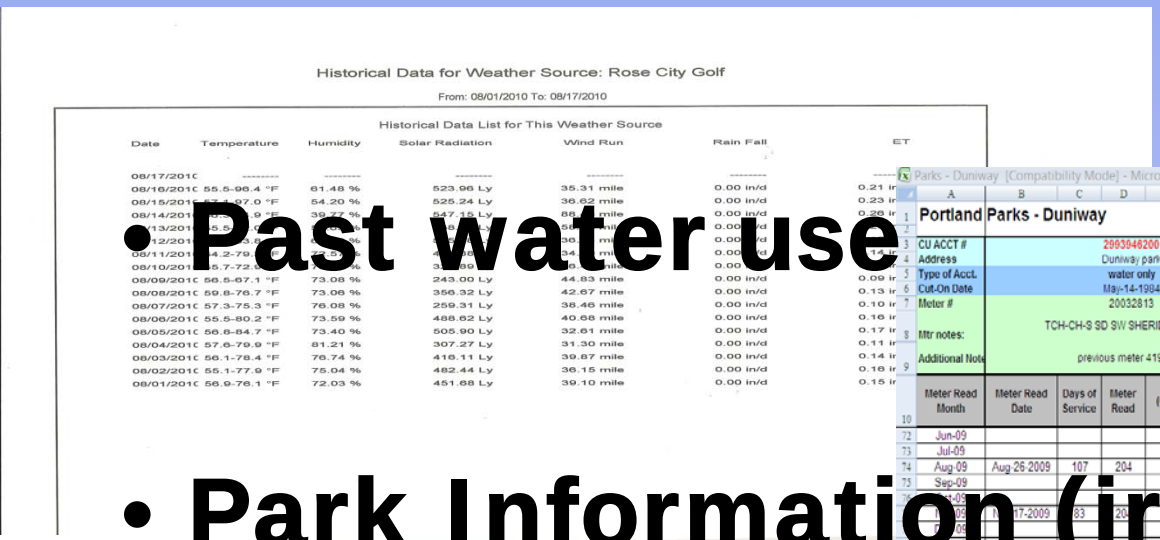
Proposed 2011 Water Allocation Challenge

- 12 Parks selected (2 in each zone)
- 6 additoinal parks (1 in each zone) identified as "Indicator Parks" Under CIC / ET control. In the Spring entire system checks and minor tune-up.
- Zones will be graded in three categories.

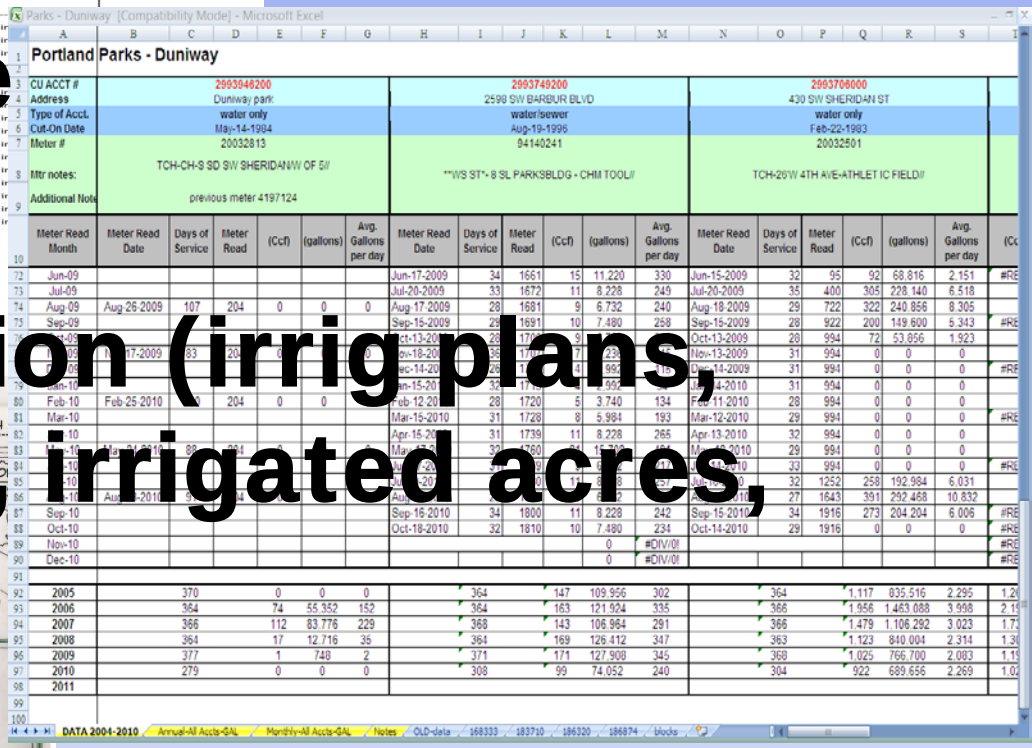
THE SCORECARD

1. Completeness and Accuracy of Workbook
2. Water Use
3. Visual appearance / usability

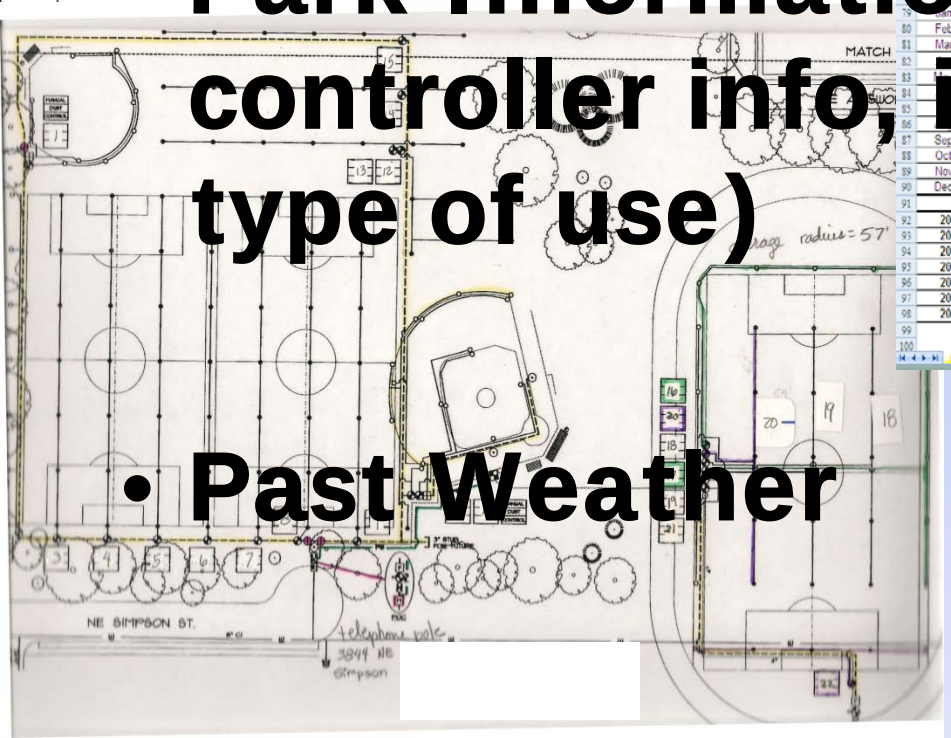
- **WHAT"S NEEDED**



- **Past water use**



- **Park Information (irrig plans, controller info, irrigated acres, type of use)**



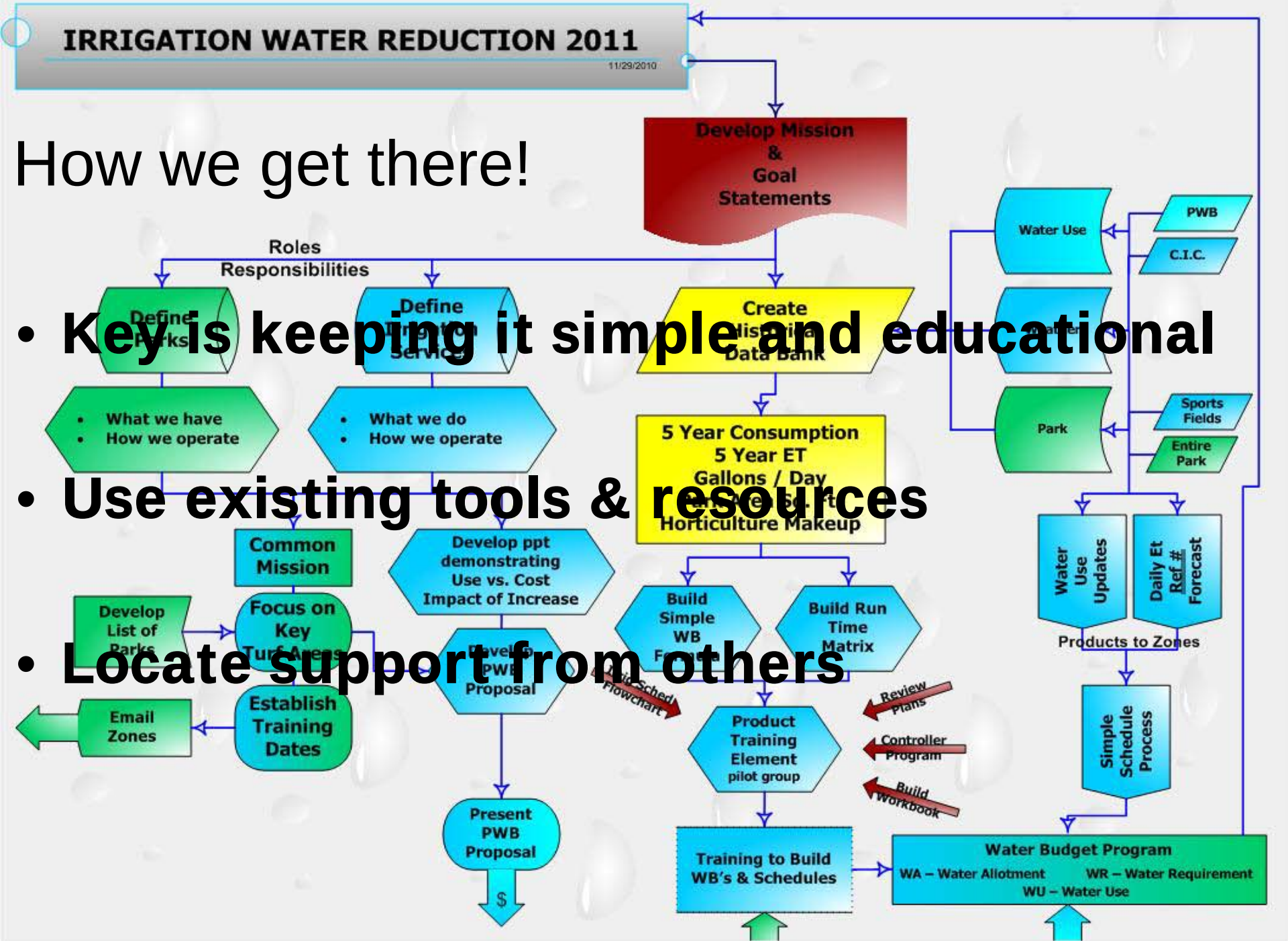
- **Past Weather**

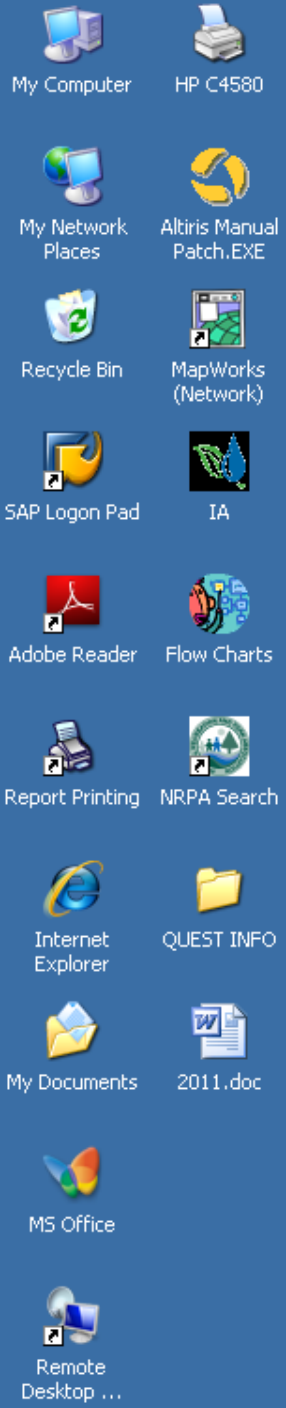
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

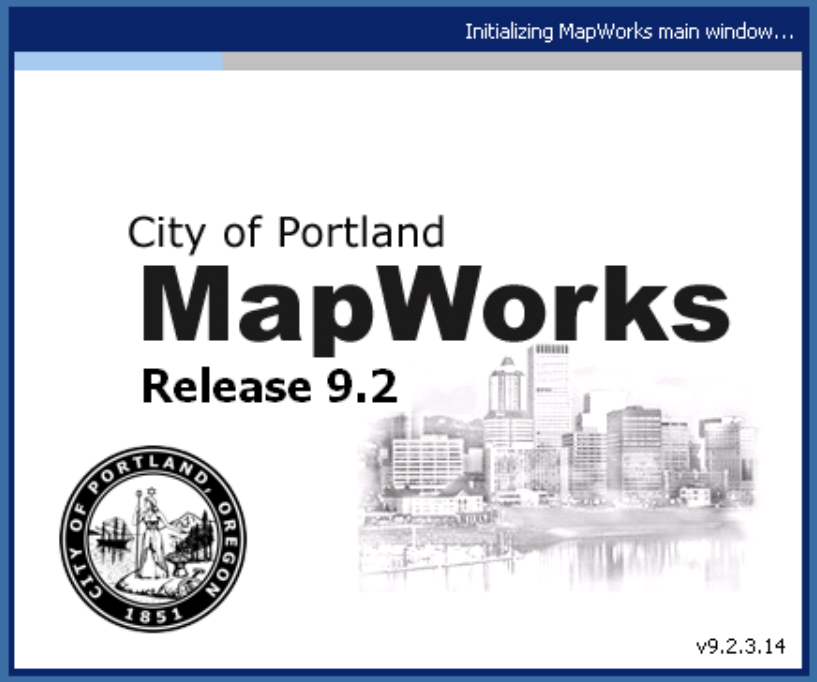
PORTLAND PARKS & RECREATION
Healthy Parks, Healthy Portland

How we get there!

- **Key is keeping it simple and educational**
- **Use existing tools & resources**
- **Locate support from others**




My Computer
HP C4580
My Network Places
Altiris Manual Patch.EXE
Recycle Bin
MapWorks (Network)
SAP Logon Pad
IA
Adobe Reader
Flow Charts
Report Printing
NRPA Search
Internet Explorer
QUEST INFO
My Documents
2011.doc
MS Office
Remote Desktop ...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City of Portland
MapWorks
Release 9.2
CITY OF PORTLAND, OREGON
1851
v9.2.3.14

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File Edit View Tools Drawing Help

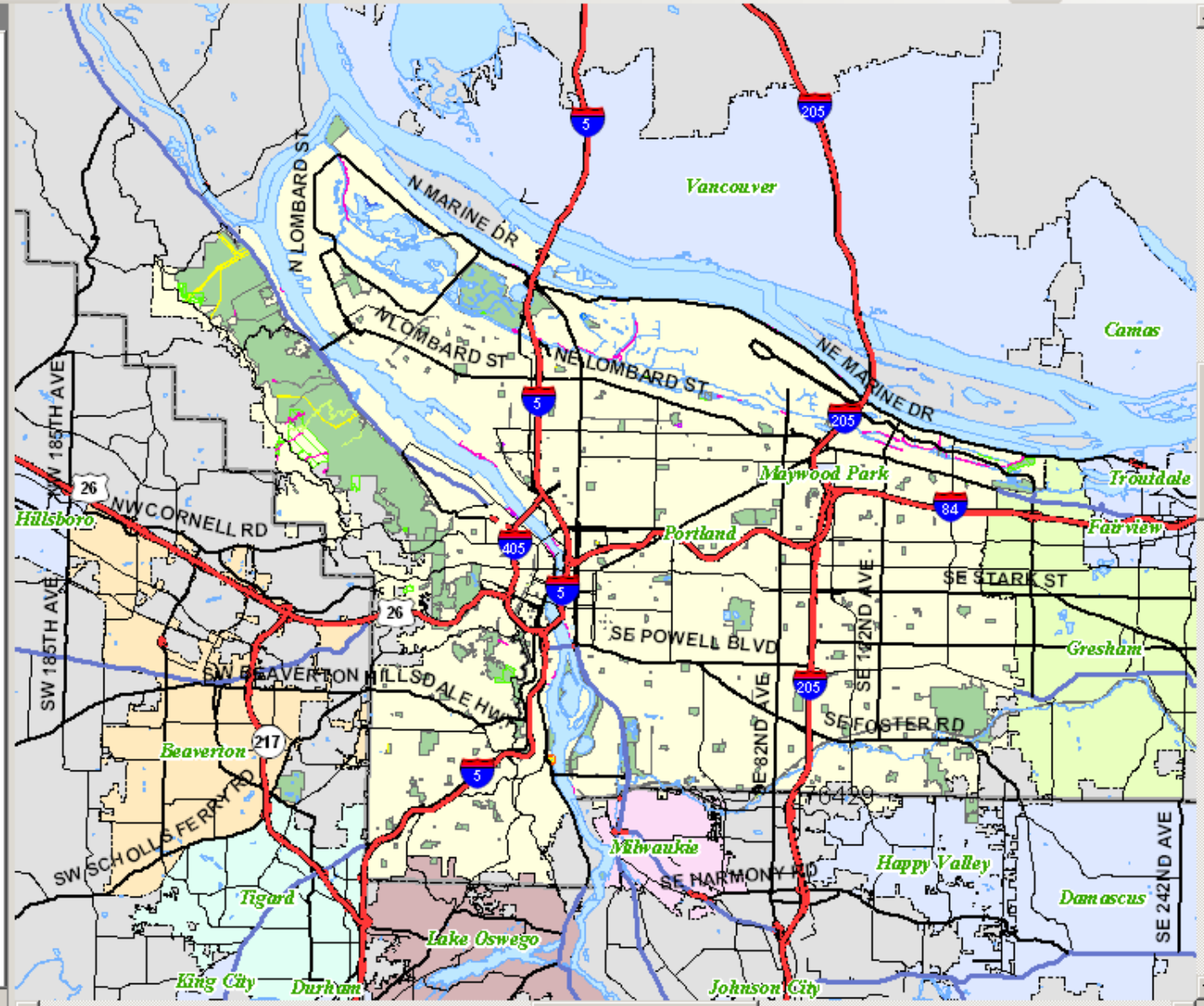
BES Unit ID

Scale: 1:188,704

Map Table of Contents

- Layers
  - Parks Agreements
  - Park Planning Documents
  - Park furnishings
  - PGE Poles
  - Trails Database
  - Streets
  - Park Easements
  - Waterbodies
  - Parks Natural Area Land Inventory
  - Building Footprints
  - Parks
  - Taxlots Data
  - Aerial Photos
  - Base Map
  - Elevation
  - Park Search Tool Layer

Legend | Add Data



Scale 1 inch = 15,725 feet

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File Edit View Tools Drawing Help

BES Unit ID | Scale: 1:6,808

Map Table of Contents

- Layers
  - [x] Water Bureau System
    - [ ] Water Primary Distribution System
    - [x] Water Services
    - [ ] Water System Valves, Fittings, Conr
    - [ ] Water System Storage
    - [ ] Water Real Estate Interest - Holding
  - [ ] Parks Agreements
  - [ ] Park Planning Documents
  - [ ] Park furnishings
  - [ ] PGE Poles
  - [ ] Trails Database
  - [x] Streets
    - [ ] Freeway Numbers
    - [x] Freeways
    - [x] Arterials
    - [ ] All Streets
      - Classification
      - Major Highway/Freeway
      - Local Highway
      - Arterial/Collector
      - Local Street (Public/Private)
      - Driveway/Unimproved ROW
      - Forest Service Road
  - [ ] Park Easements
  - [ ] Waterbodies
  - [ ] Parks Natural Area Land Inventory
  - [ ] Building Footprints
  - [ ] Parks
  - [ ] Taxlots Data
  - [x] Aerial Photos
  - [ ] Base Map
    - [x] Municipal Boundaries
    - [x] County Boundaries
    - [ ] City of Portland Refined Streams

Legend | Add Data

Scale 1 inch = 567 feet

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File Edit View Tools Drawing Help

BES Unit ID | Scale: 1:1,802

Map Table of Contents

- Layers
  - [x] Water Bureau System
    - [ ] Water Primary Distribution System
    - [x] Water Services
    - [ ] Water System Valves, Fittings, Conr
    - [ ] Water System Storage
    - [ ] Water Real Estate Interest - Holding
  - [ ] Parks Agreements
  - [ ] Park Planning Documents
  - [ ] Park furnishings
  - [ ] PGE Poles
  - [ ] Trails Database
  - [x] Streets
    - [ ] Freeway Numbers
    - [x] Freeways
    - [x] Arterials
    - [ ] All Streets
      - Classification
      - Major Highway/Freeway
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      - Arterial/Collector
      - Local Street (Public/Private)
      - Driveway/Unimproved ROW
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  - [ ] Park Easements
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  - [ ] Parks Natural Area Land Inventory
  - [ ] Building Footprints
  - [ ] Parks
  - [ ] Taxlots Data
  - [x] Aerial Photos
  - [ ] Base Map
    - [x] Municipal Boundaries
    - [x] County Boundaries
    - [ ] City of Portland Refined Streams

Legend | Add Data

Current segment length: 30.969 FT Area: 66,002.727 SQFT or 1.515 Acres

Know What You Have

Current segment length: 30.969 FT Area: 66,002.727 SQFT or 1.515 Acres

Scale 1 inch = 150 feet

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File Edit View Tools Drawing Help

BES Unit ID

Scale: 1:481

Scale 1 inch = 40 feet

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File Edit View Tools Drawing Help

BES Unit ID

Scale: 1:2,500

Locate Park

Filter parks by name:

Fern

Double-click on a park to locate it on the map:

Fernhill Park

Fernwood MS

Scale 1 inch = 208 feet

MapWorks - [\\Pkhaleakala\GIS\Applications\MapWorks\MapWorks_Ops.mxd]

File Edit View Tools Drawing Help

BES Unit ID | Scale: 1:1,641

Identify

Identify from: Services

Location: 7,658,355.241 699,334.635 Feet

Field	Value
MainMaterial	CastIron
QuarterSection	2434
Status	Active
Subtype	IrrigationService
FACILITYID	380957
METERSIZE	2
MeterMake	Trident
METERLOCATIONDETAIL	FERNHILL PARK IRRIGATION SERVICE
ALTLOCATIONDETAIL	C N EDGE TURNAROUND

Identified 1 feature

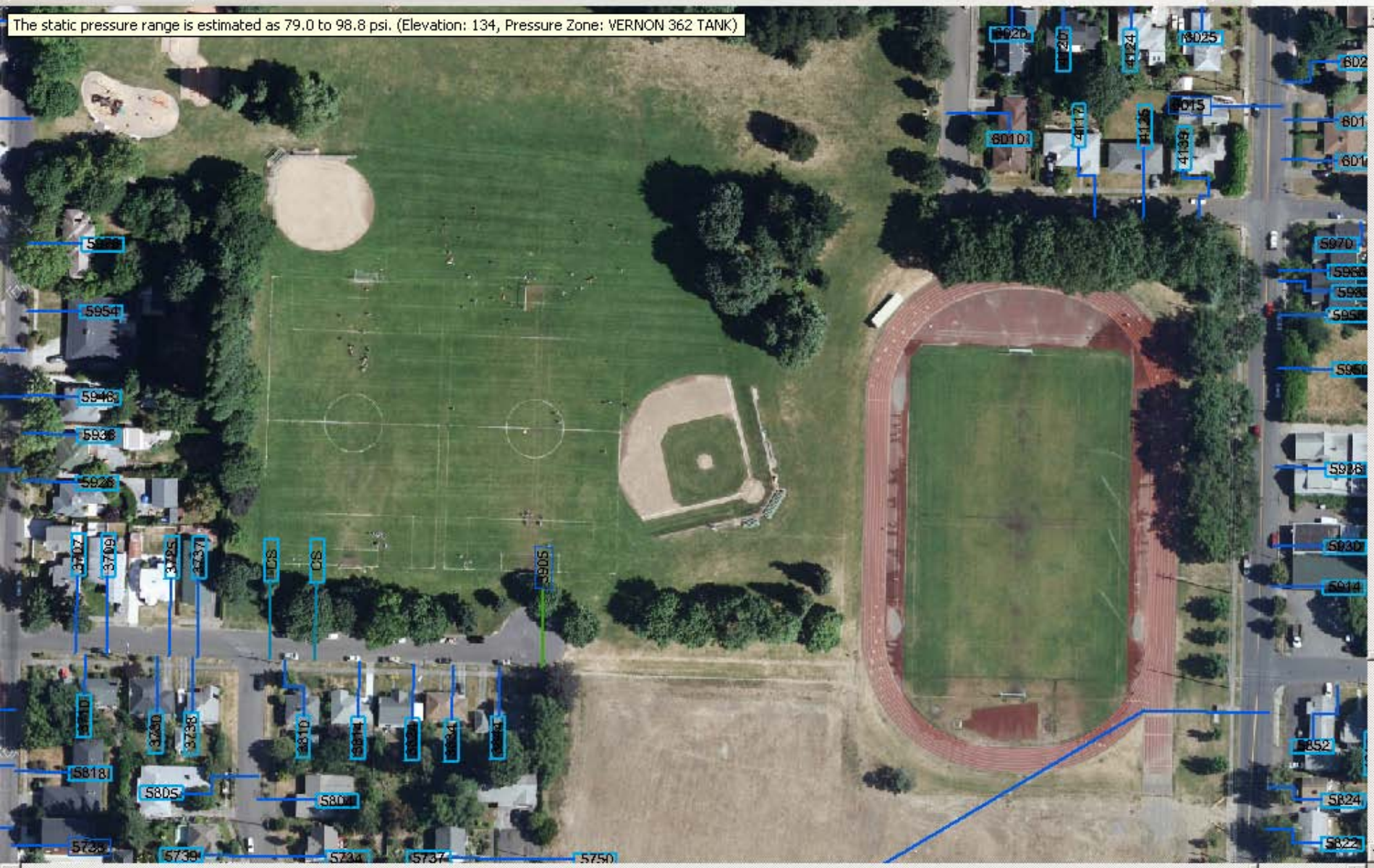
Scale 1 inch = 137 feet

MapWorks - [\\Pkhaleakala\GIS\Applications\MapWorks\MapWorks_Ops.mxd]

File Edit View Tools Drawing Help

BES Unit ID | Scale: 1:1,641

The static pressure range is estimated as 79.0 to 98.8 psi. (Elevation: 134, Pressure Zone: VERNON 362 TANK)



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Scale 1 inch = 137 feet

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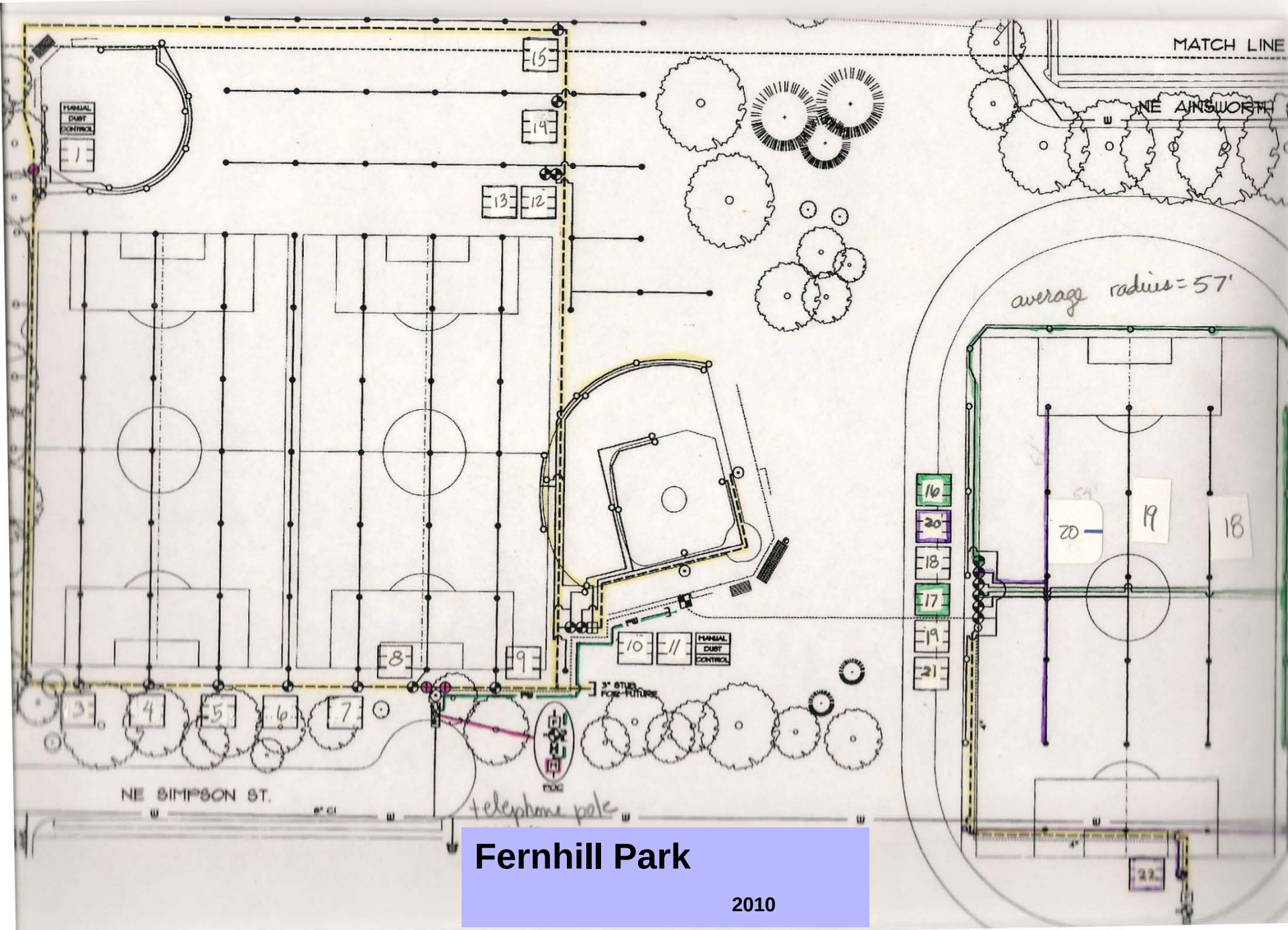
File Edit View Tools Drawing Help

BES Unit ID | Scale: 1:982

Current segment length: 16.019 FT Area: 93,831.457 SQFT or 2.154 Acres

Current segment length: 16.019 FT Area: 93,831.457 SQFT or 2.154 Acres

Scale 1 inch = 82 feet



Fernhill Park

2010

FERNHILL
PARK
PORTLAND PARKS & RECREATION
HOURS: OPEN 5:00AM to 12:01AM

WELCOME
Fernhill Park Off-Leash Area

This is a shared site. Park users should expect to encounter off-leash dogs in this area during posted off-leash hours. Off-leash use is allowed within designated boundaries and hours only.

Dogs Must:

- Always stay on-leash outside the off-leash area.
- When off-leash, stay within the off-leash area. No off-leash dogs are allowed in playgrounds, picnic areas, sportsfields, or natural areas.
- Display tags showing proof of current license and rabies vaccination.
- Demonstrate appropriate social interaction; dogs displaying aggressive behavior toward people or other dogs must be leashed and removed from the area immediately.

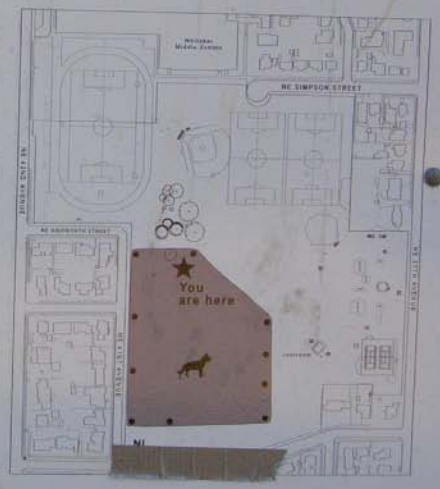
Handlers Must:

- Pick up and dispose of your dog's waste in the appropriate receptacle.
- Carry a leash for each dog in your care.
- Closely supervise young children.
- Accept responsibility for any damage or injury caused by your dog.
- Remain in the off-leash area to supervise your dog. Keep your dog within view and under verbal control at all times.
- Bring no more than three dogs to the off-leash area at any time.
- To prevent injury, remove pinch or choke collars when playing off-leash.
- For health and safety reasons, do not bring a dog in heat to a Portland park.
- For health and safety reasons, do not bring a puppy without a complete cycle of vaccinations to a Portland park.
- Comply with all other park rules.

Please be considerate of park neighbors. Play quietly with your pet in the early morning and evening hours. Be respectful of other park visitors and protect park wildlife. Multnomah County Animal Control Services and Portland Park Rangers have the authority to enforce leash and scoop laws. **Violators are subject to a $150 fine or park exclusion.**

HOURS
All days: 5am-midnight

All off-leash sites are subject to regular closures for routine maintenance as well as longer term closures for restoration as needed. Off-leash users are expected to adhere to the leash law when the off-leash area is not available.



PORTLAND PARKS & RECREATION
Healthy Parks, Healthy Portland

503-823-PLAY
www.PortlandParks.org
Director Zari Santner

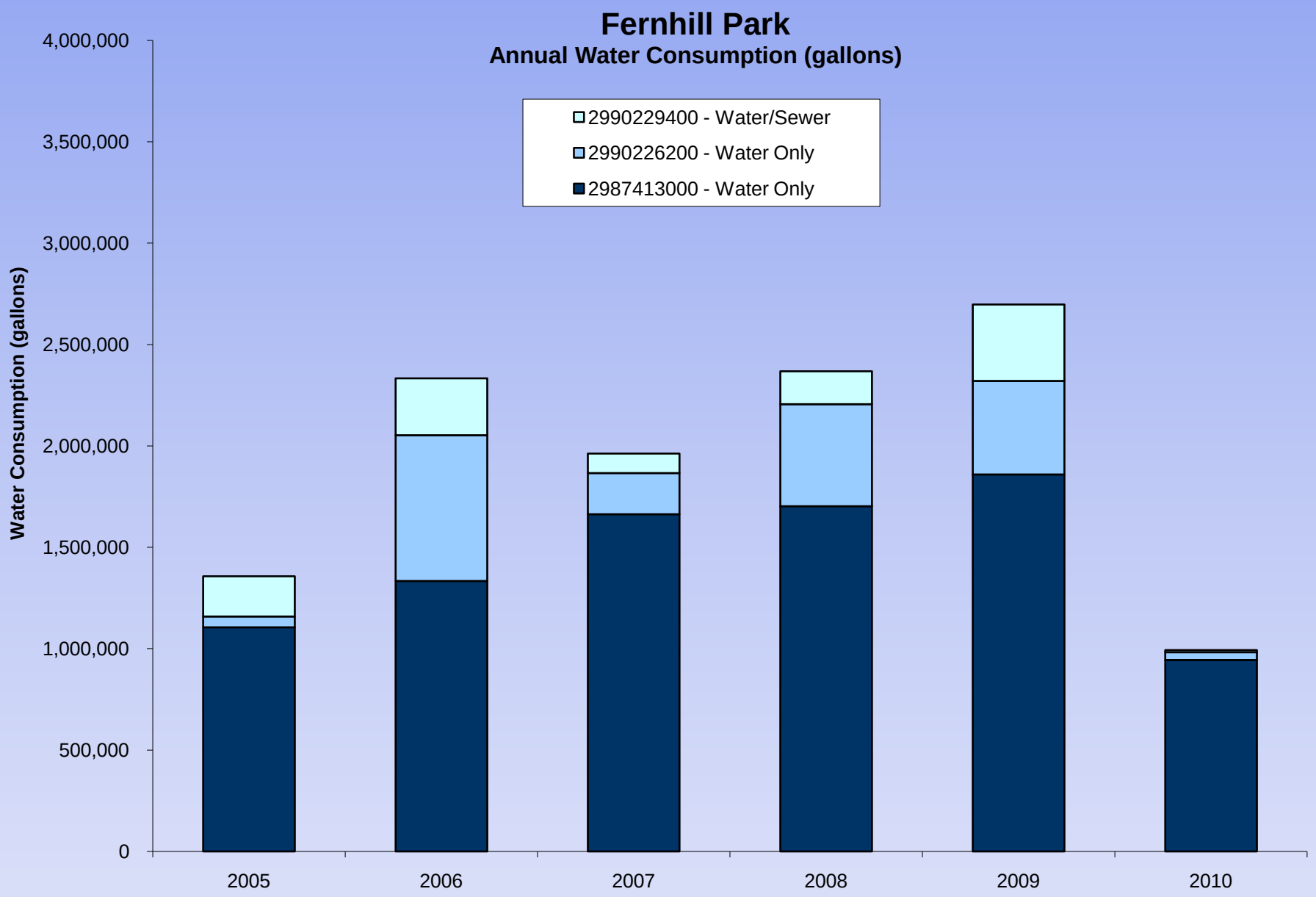
Parks - Fernhill(2) [Compatibility Mode] - Microsoft Excel

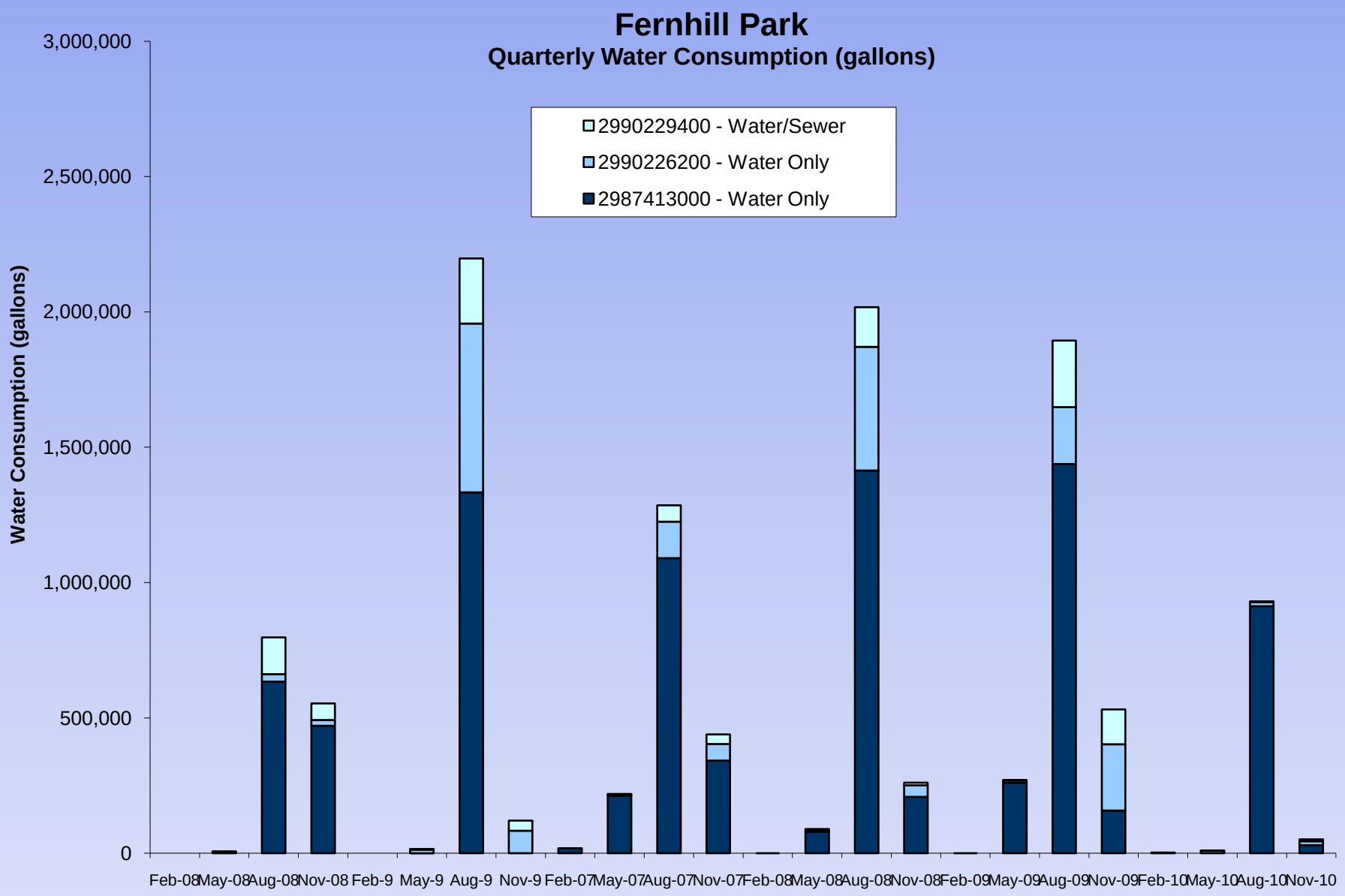
Portland Fernhill

																Transferred to PBOT - Maintenance Operations		Transferred to PBOT - Maintenance Operations	
CU ACCT #			2990229400			2990226200					2987413000			TOTAL		2979586300		2992517900	
Address			6100 NE 37TH AVE			NE 39&HOLMAN ST					3905 NE SIMPSON ST			All Accounts		3698 NE HOLMAN ST		4097 NE HOLMAN ST	
Type of Acct.			wat/sew			water only					water only					Irrigation		Irrigation	
Cut-on Date			Feb-22-1983			Feb-22-1983					Feb-22-1983					Jul-01-2002		Jul-01-2002	
Meter #			99140015			20032697					20032469					29231868		25905995	
Mtr notes:			TCH-OPP SL 6057-15'E ST-W GB#			OPP CHIM 3915#					TCH-CHAM-OPP EPL#3844#					ESISLAND-INTERSECTIOOF 37TH AV#		NE COR OF TRAFFIC ISLAND#	
Meter Read Month	Days of Service	Meter Read	(ccf)	(gallons)	Meter Read	(ccf)	(gallons)	Meter Read Date	Days of Service	Meter Read	(ccf)	(gallons)	(ccf)	(gallons)	(ccf)	(gallons)	(ccf)	(gallons)	
Nov-08	95	1388	82	61,336	71	28	20,944	Nov-29-2005	91	1478	630	471,240	740	553,520	0	0	0	0	
Feb-9	94	1388	0	0	71	0	0	Mar-02-2006	93	1478	0	0	0	0	0	0	0	0	
May-9	84	1392	4	2,992	87	16	11,968	May-31-2006	90	1479	1	748	21	15,708	0	0	0	0	
Aug-9	97	1714	322	240,856	920	833	623,084	Sep-01-2006	93	3262	1,783	1,333,684	2,938	2,197,624	0	0	0	0	
Nov-9	84	1764	50	37,400	1031	111	83,028	Nov-29-2006	89	3262	0	0	161	120,428	0	0	0	0	
Feb-07	98	1764	0	0	1031	0	0	Feb-28-2007	91	3287	25	18,700	25	18,700	0	0	0	0	
May-07	85	1765	1	748	1039	8	5,984	May-29-2007	90	3571	284	212,432	293	219,164	0	0	0	0	
Aug-07	92	1846	81	60,588	1219	180	134	Aug-29-2007	92	5029	1,458	1,090,584	1,719	1,285,812	0	0	0	0	
Nov-07	95	1894	48	35,904	1301	82	61	-04-2007	97	5486	457	341,836	587	439,076	0	0	0	0	
Feb-08	91	1894	0	0	1302	1	74	008	86	5486	0	0	1	748	0	0	0	0	
May-08	86	1902	8	5,984	1307	5	3,740		91	5593	107	80,036	120	89,760	0	0	0	0	
Aug-08	97	2098	196	146,608	1917	610	456,280	Sep-		7484	1,891	1,414,468	2,697	2,017,356	0	0	0	0	
Nov-08	96	2111	13	9,724	1974	57	42,636	Dec-02-20		62	278	207,944	348	260,304	0	0	0	0	
Feb-09	88	2111	0	0	1974	0	0	Mar-03-2009			2	1,496	2	1,496	0	0	0	0	
May-09	96	2114	3	2,244	1984	10	7,480	Jun-08-2009	97			261,052	362	270,776	0	0	0	0	
Aug-09	70	2442	328	245,344	2265	281	210,188	Sep-08-2009	92	1005		404	2,532	1,893,936	0	0	0	0	
Nov-09	90	2614	172	128,656	2592	327	244,596	Dec-10-2009	93	10247	2		710	531,080	0	0	0	0	
Feb-10	93	2614	0	0	2592	0	0	Mar-12-2010	92	10250	3			2,244	0	0	0	0	
May-10	90	2616	2	1,496	2603	11	8,228	Jun-09-2010	89	10250	0	0		9,724	0	0	0	0	
Aug-10	91	2619	3	2,244	2624	21	15,708	Sep-03-2010	86	11470	1,220	912,560		512	0	0	0	0	
Nov-10	89	2628	9	6,732	2643	19	14,212	Dec-08-2010	96	11510	40	29,920	66		0	0	0	0	
2005	370		266	198,968		71	53,108		365		1,478	1,105,544	1,815	1,357	0	0	0	0	
2006	359		376	281,248		960	718,080		365		1,784	1,334,432	3,120	2,333,760	0	0	0	0	
2007	370		130	97,240		270	201,960		370		2,224	1,663,552	2,624	1,962,752	0	0	0	0	
2008	370		217	162,316		673	503,404		364		2,276	1,702,448	3,166	2,368,168	0	0	0	0	
2009	344		503	376,244		618	462,264		373		2,485	1,858,780	3,606	2,697,288	0	0	0	0	
2010	363		14	10,472		51	38,148		363		1,263	944,724	1,328	993,344	0	0	0	0	

Know What You Use

Data 2004-present | Annual-GAL | Quarterly-GAL | Notes | Data 1994-2003 | 31214 | 31223 | 31270 | 31318 | 45330


Fernhill Park
Annual Water Consumption (gallons)
2990229400 - Water/Sewer
2990226200 - Water Only
2987413000 - Water Only
Water Consumption (gallons)
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
2005
2006
2007
2008
2009
2010


Fernhill Park
Quarterly Water Consumption (gallons)
2990229400 - Water/Sewer
2990226200 - Water Only
2987413000 - Water Only
Water Consumption (gallons)
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Feb-08
May-08
Aug-08
Nov-08
Feb-9
May-9
Aug-9
Nov-9
Feb-07
May-07
Aug-07
Nov-07
Feb-08
May-08
Aug-08
Nov-08
Feb-09
May-09
Aug-09
Nov-09
Feb-10
May-10
Aug-10
Nov-10

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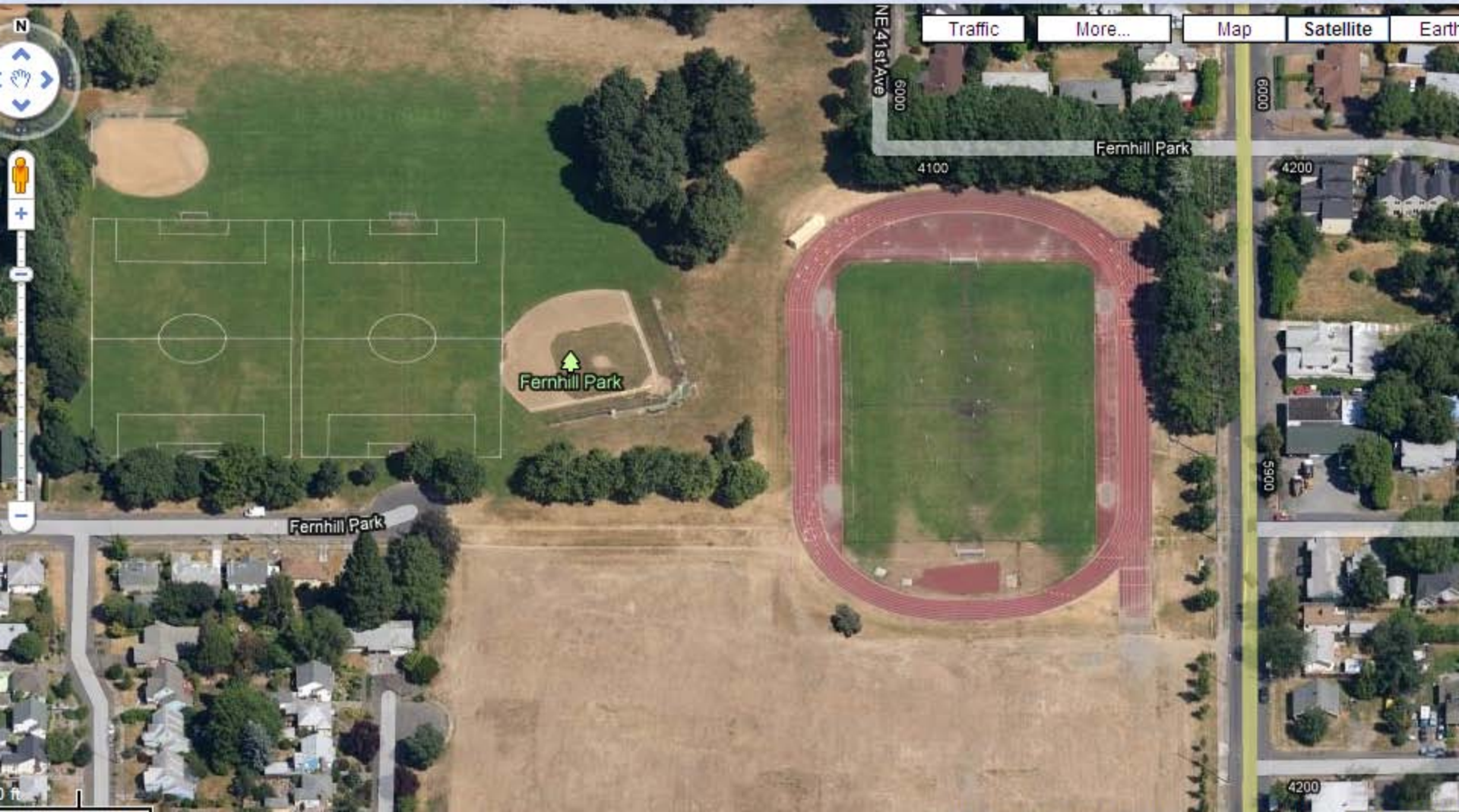


MapWorks - Microsoft Virtual Earth Window

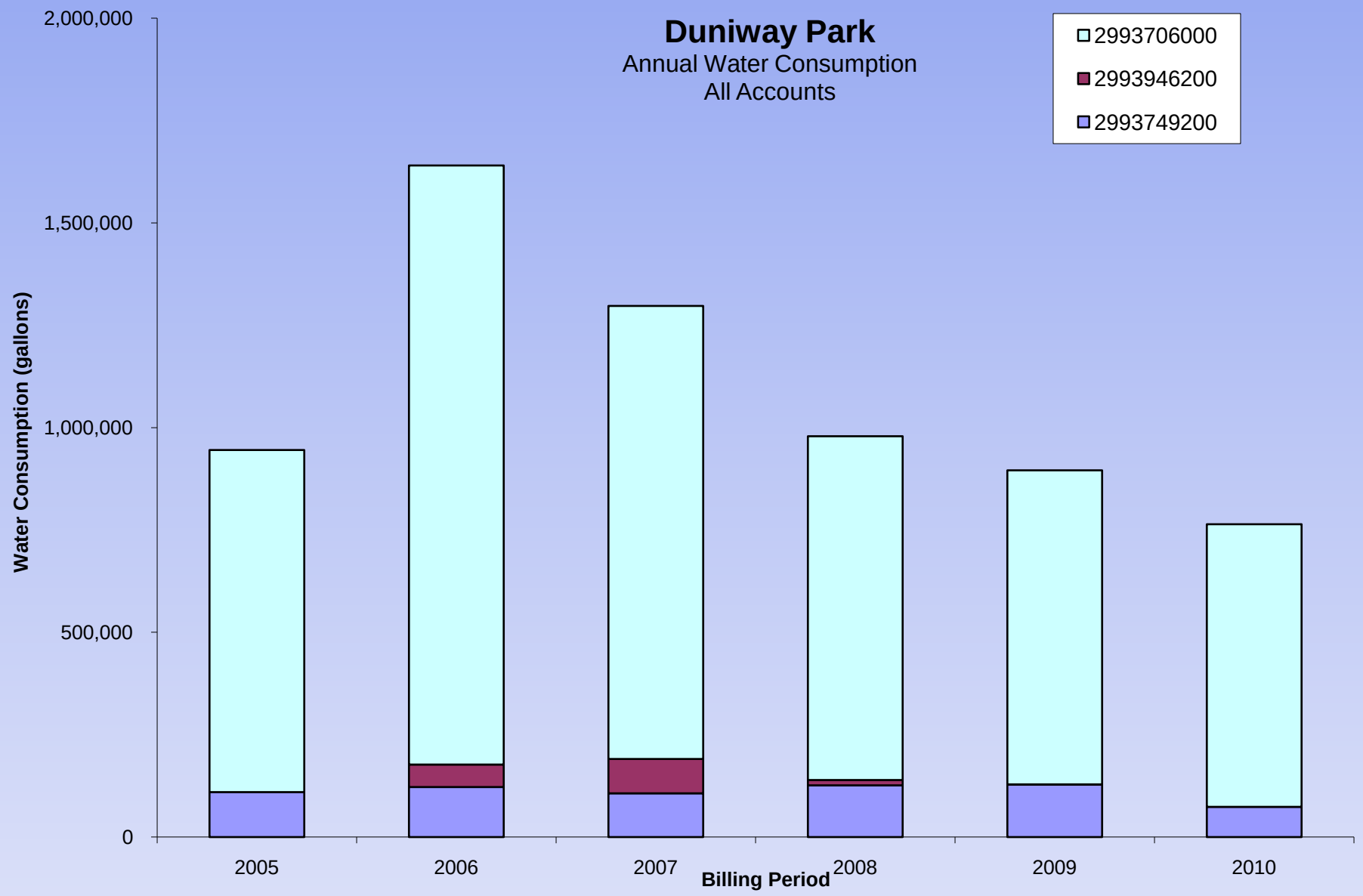
Portland Parks - Duniway

CU ACCT #	2993946200	2993749200	2993706000
Address	Duniway park	2598 SW BARBUR BLVD	430 SW SHERIDAN ST
Type of Acct.	water only	water/sewer	water only
Cut-On Date	May-14-1984	Aug-19-1996	Feb-22-1983
Meter #	20032813	94140241	20032501
Mtr notes:	TCH-CH-S SD SW SHERIDAN/W OF 5//	**WS ST*- 8 SL PARKSBLDG - CHM TOOL//	TCH-26'W 4TH AVE-ATHLET IC FIELD//
Additional Note	previous meter 4197124		

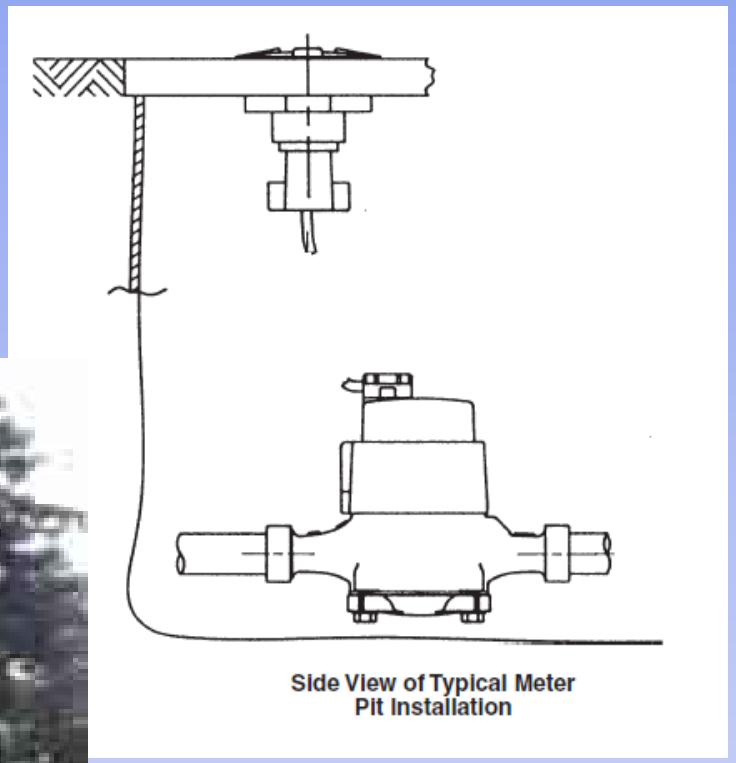
Meter Read Month	Meter Read Date	Days of Service	Meter Read	(Ccf)	(gallons)	Avg. Gallons per day	Meter Read Date	Days of Service	Meter Read	(Ccf)	(gallons)	Avg. Gallons per day	Meter Read Date	Days of Service	Meter Read	(Ccf)	(gallons)	Avg. Gallons per day
Jun-09							Jun-17-2009	34	1661	15	11,220	330	Jun-15-2009	32	95	92	68,816	2,151
Jul-09							Jul-20-2009	33	1672	11	8,228	249	Jul-20-2009	35	400	305	228,140	6,518
Aug-09	Aug-26-2009	107	204	0	0	0	Aug-17-2009	28	1681	9	6,732	240	Aug-18-2009	29	722	322	240,856	8,305
Sep-09							Sep-15-2009	29	1691	10	7,480	258	Sep-15-2009	28	922	200	149,600	5,343
Oct-09							Oct-13-2009	28	1700	9	6,732	240	Oct-13-2009	28	994	72	53,856	1,923
Nov-09	Nov-17-2009	83	204	0	0	0	Nov-18-2009	36	1707	7	5,236	145	Nov-13-2009	31	994	0	0	0
Dec-09							Dec-14-2009	26	1711	4	2,992	115	Dec-14-2009	31	994	0	0	0
Jan-10							Jan-15-2010	32	1715	4	2,992	94	Jan-14-2010	31	994	0	0	0
Feb-10	Feb-25-2010	100	204	0	0	0	Feb-12-2010	28	1720	5	3,740	134	Feb-11-2010	28	994	0	0	0
Mar-10							Mar-15-2010	31	1728	8	5,984	193	Mar-12-2010	29	994	0	0	0
Apr-10							Apr-15-2010	31	1739	11	8,228	265	Apr-13-2010	32	994	0	0	0
May-10	May-24-2010	88	204	0	0	0	May-17-2010	32	1760	21	15,708	491	May-12-2010	29	994	0	0	0
Jun-10							Jun-17-2010	31	1769	9	6,732	217	Jun-14-2010	33	994	0	0	0
Jul-10							Jul-19-2010	32	1780	11	8,228	257	Jul-16-2010	32	1252	258	192,984	6,031
Aug-10	Aug-23-2010	91	204	0	0	0	Aug-13-2010	25	1789	9	6,732	269	Aug-12-2010	27	1643	391	292,468	10,832
Sep-10							Sep-16-2010	34	1800	11	8,228	242	Sep-15-2010	34	1916	273	204,204	6,006
Oct-10							Oct-18-2010	32	1810	10	7,480	234	Oct-14-2010	29	1916	0	0	0
Nov-10											0	#DIV/0!						
Dec-10											0	#DIV/0!						
2005		370		0	0	0		364		147	109,956	302		364		1,117	835,516	2,295
2006		364		74	55,352	152		364		163	121,924	335		366		1,956	1,463,088	3,998
2007		366		112	83,776	229		368		143	106,964	291		366		1,479	1,106,292	3,023
2008		364		17	12,716	35		364		169	126,412	347		363		1,123	840,004	2,314
2009		377		1	748	2		371		171	127,908	345		368		1,025	766,700	2,083
2010		279		0	0	0		308		99	74,052	240		304		922	689,656	2,269
2011																		

CU ACCT #	2993946200	2993749200
Address	Duniway park	2598 SW BARBUR BLVD
Type of Acct.	water only	water/sewer
Cut-On Date	May-14-1984	Aug-19-1996
Meter #	20032813	94140241
Mtr notes:	TCH-CH-S SD SW SHERIDAN/W OF 5//	**WS ST*- 8 SL PARKSBLDG - CHM TOOL//
Additional Note	previous meter 4197124	

Meter Read Month	Meter Read Date	Days of Service	Meter Read	(Ccf)	(gallons)	Avg. Gallons per day	Meter Read Date	Days of Service	Meter Read	(Ccf)	(gallons)
Apr-04											
Jun-04											
Jul-04							Jul-15-2004	31	847	31	23,188
Aug-04	Aug-05-2004	87	2258	809	605,132	6,956	Aug-12-2004	28	862	15	11,220
Sep-04							Sep-09-2004	28	879	17	12,716
Oct-04							Oct-13-2004	34	899	20	14,960
Nov-04	Nov-02-2004	89	2269	11	8,228	92	Nov-12-2004	30	911	12	8,976
Dec-04							Dec-09-2004	27	918	7	5,236
Jan-05							Jan-10-2005	32	924	6	4,488
Feb-05	Feb-03-2005	93	2269	0	0	0	Feb-14-2005	35	932	8	5,984
Mar-05							Mar-09-2005	23	939	7	5,236
Apr-05							Apr-11-2005	33	950	11	8,228
May-05	May-05-2005	91	2269	0	0	0	May-09-2005	28	962	12	8,976


Duniway Park
Annual Water Consumption
All Accounts
2993706000
2993946200
2993749200
Water Consumption (gallons)
2,000,000
1,500,000
1,000,000
500,000
0
2005
2006
2007
2008
2009
2010
Billing Period

Weekly Meter Reading



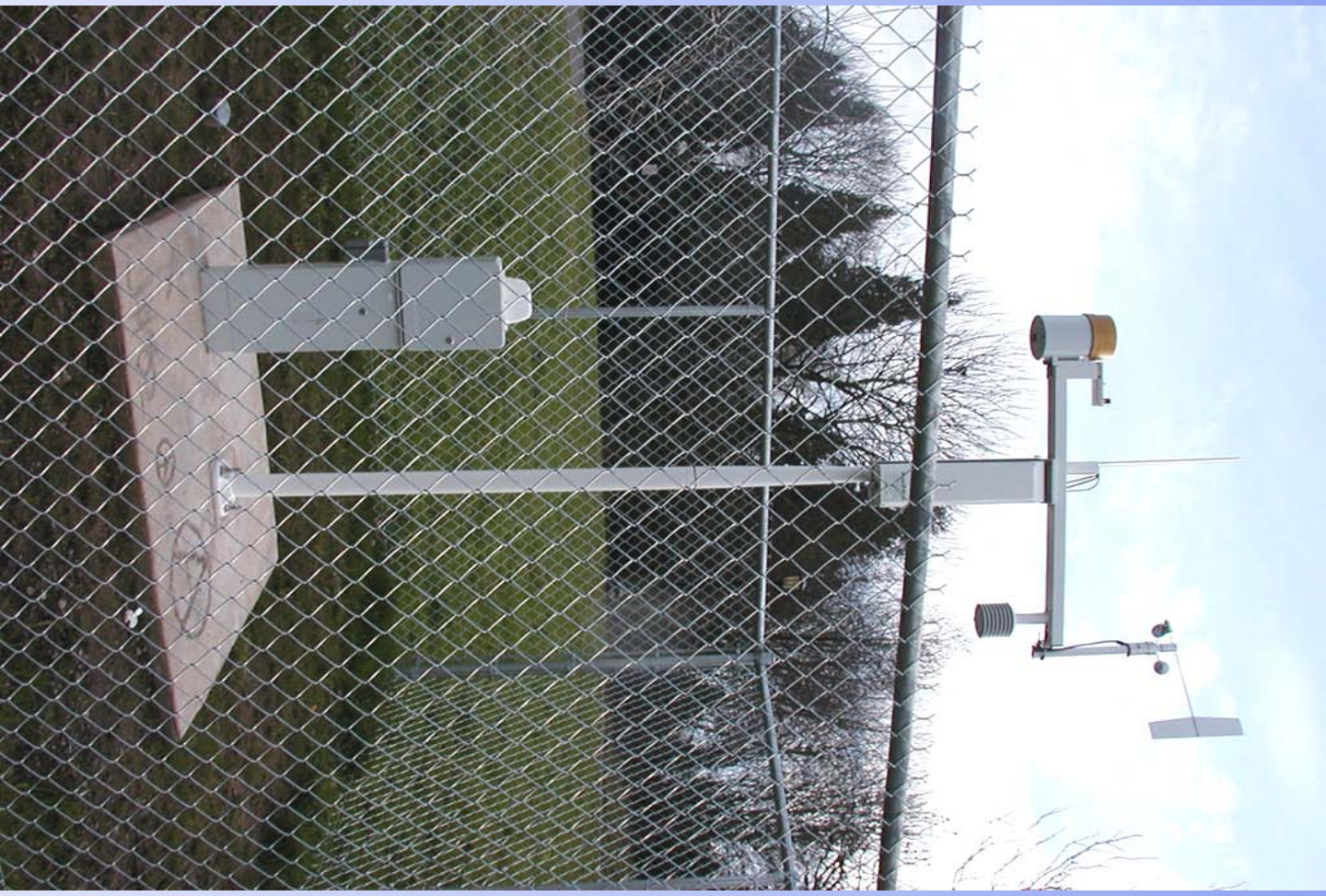
Reaction Data

Timely

Precise

Usable

Rose City Weather Station



Historical Data for Weather Source: Rose City Golf

From: 08/01/2010 To: 08/17/2010

Historical Data List for This Weather Source

Date	Temperature	Humidity	Solar Radiation	Wind Run	Rain Fall	ET
08/17/201C	--------	--------	--------	--------	--------	--------
08/16/201C	55.5-96.4 °F	61.48 %	523.96 Ly	35.31 mile	0.00 in/d	0.21 in/d
08/15/201C	57.1-97.0 °F	54.20 %	525.24 Ly	36.62 mile	0.00 in/d	0.23 in/d
08/14/201C	56.3-94.9 °F	39.77 %	547.15 Ly	88.48 mile	0.00 in/d	0.26 in/d
08/13/201C	55.5-92.0 °F	55.65 %	538.43 Ly	58.46 mile	0.00 in/d	0.23 in/d
08/12/201C	54.6-83.8 °F	68.90 %	525.48 Ly	36.14 mile	0.00 in/d	0.18 in/d
08/11/201C	54.2-79.3 °F	72.57 %	421.88 Ly	34.70 mile	0.00 in/d	0.14 in/d
08/10/201C	55.7-72.9 °F	73.19 %	325.89 Ly	36.44 mile	0.00 in/d	0.11 in/d
08/09/201C	56.5-67.1 °F	73.08 %	243.00 Ly	44.83 mile	0.00 in/d	0.09 in/d
08/08/201C	59.8-76.7 °F	73.06 %	356.32 Ly	42.67 mile	0.00 in/d	0.13 in/d
08/07/201C	57.3-75.3 °F	76.08 %	259.31 Ly	38.46 mile	0.00 in/d	0.10 in/d
08/06/201C	55.5-80.2 °F	73.59 %	488.62 Ly	40.68 mile	0.00 in/d	0.16 in/d
08/05/201C	56.8-84.7 °F	73.40 %	505.90 Ly	32.61 mile	0.00 in/d	0.17 in/d
08/04/201C	57.6-79.9 °F	81.21 %	307.27 Ly	31.30 mile	0.00 in/d	0.11 in/d
08/03/201C	56.1-78.4 °F	76.74 %	416.11 Ly	39.87 mile	0.00 in/d	0.14 in/d
08/02/201C	55.1-77.9 °F	75.04 %	482.44 Ly	36.15 mile	0.00 in/d	0.16 in/d
08/01/201C	56.9-76.1 °F	72.03 %	451.68 Ly	39.10 mile	0.00 in/d	0.15 in/d

Know What You Need

Water Meter Info by Park 10122010 - Microsoft Excel

	May			June			July			August			September			October		
2010	rain	et	high temp	rain	et	high temp	rain	et	high temp	rain	et	high temp	rain	et	high temp	rain	et	high temp
1	0.01	0.09	60.3	0.21	0.07	63.3	0.09	0.09	66.4	0.00	0.15	76.1	0.14	0.08	73.3	0.00	0.05	68.6
2	0.00	0.1	61.6	0.81	0.06	64.7	0.32	0.07	64.2	0.00	0.16	77.9	0.00	0.17	84.8	0.00	0.05	67.3
3	0.14	0.09	56.2	0.25	0.08	61.5	0.00	0.14	69.1	0.00	0.14	78.4	0.00	0.18	88.5	0.00	0.04	63.5
4	0.35	0.06	52.5	0.68	0.07	62.1	0.00	0.09	66.2	0.00	0.11	79.9	0.00	0.11	70.8	0.00	0.04	59.7
5	0.05	0.1	55.5	0.00	0.18	74.5	0.00	0.11	67.6	0.00	0.17	84.7	0.00	0.09	69.1	0.00	0.06	68.0
6	0.00	0.1	58.3	1.17	0.05	63.1	0.00	0.23	84.8	0.00	0.16	80.2	0.00	0.11	73.1	0.00	0.09	77.4
7	0.00	0.13	69.5	0.05	0.14	68.9	0.00	0.28	92.9	0.00	0.10	75.3	0.56	0.05	66.2	0.00	0.04	63.0
8	0.00	0.17	69.5	0.10	0.13	72.2	0.00	0.26	96.5	0.00	0.13	76.7	0.01	0.06	65.3	0.00	0.05	69.3
9	0.02	0.16	71.2	0.41	0.10	64.5	0.00	0.26	94.5	0.00	0.09	67.1	0.00	0.05	64.9	0.79	0.03	67.9
10	0.27	0.11	62.3	0.80	0.06	58.3	0.00	0.21	83.3	0.00	0.11	72.9	0.00	0.07	68.2	1.10	0.03	67.6
11	0.00	0.07	60.5	0.00	0.08	62.5	0.00	0.18	81.0	0.00	0.14	79.3	0.00	0.09	71.6	0.00	0.04	61.1
12	0.00	0.14	65.4	0.00	0.20	81.2	0.00	0.12	66.7	0.00	0.18	83.8	0.00	0.11	71.0	0.00	0.05	65.9
13	0.00	0.18	73.4	0.00	0.20	71.1	0.00	0.14	71.2	0.00	0.23	92.0	0.00	0.09	75.7	0.00	0.06	70.3
14	0.00	0.19	76.6	0.00	0.10	66.0	0.00	0.22	84.0	0.00	0.26	94.9	0.00	0.06	72.6	0.02	0.05	67.4
15	0.00	0.16	73.2	0.54	0.08	57.1	0.00	0.23	84.5	0.00	0.23	97.0	0.21	0.06	72.8	0.00	0.04	58.5
16	0.03	0.12	72.8	0.07	0.04	57.4	0.00	0.18	75.6	0.00	0.21	96.4	0.19	0.05	72.9	0.00	0.04	59.9
17	0.06	0.14	75.8	0.00	0.09	63.2	0.00	0.14	73.6	0.00	0.16	90.4	0.20	0.05	70.6	0.00	0.04	60.8
18	0.33	0.08	63.3	0.00	0.13	69.7	0.00	0.14	71.1	0.00	0.13	76.2	0.63	0.03	67.5	0.00	0.04	62.6
19	0.33	0.11	65.6	0.01	0.10	66.1	0.00	0.14	73.5	0.01	0.10	73.0	0.20	0.07	71.5	0.00	0.04	67.5
20	0.51	0.10	56.3	0.07	0.04	58.6	0.00	0.10	71.7	0.00	0.16	74.6	0.01	0.07	65.8	0.00	0.05	69.3
21	0.31	0.05	53.9	0.00	0.10	66.4	0.00	0.15	80.2	0.00	0.10	69.7	0.00	0.07	67.1	0.00	0.03	62.2
22	0.41	0.08	57.2	0.00	0.15	74.6	0.00	0.16	73.9	0.00	0.10	71.3	0.00	0.07	68.8	0.01	0.04	61.6
23	0.20	0.07	57.0	0.00	0.21	81.8	0.00	0.19	82.8	0.00	0.16	79.8	0.08	0.04	61.3	0.49	0.03	62.7
24	0.00	0.10	61.9	0.00	0.22	80.7	0.00	0.25	91.1	0.00	0.21	92.8	0.00	0.07	73.5	1.30	0.02	53.7
25	0.76	0.07	63.5	0.00	0.14	73.8	0.00	0.24	88.5	0.00	0.20	95.4	0.00	0.08	78.2	0.24	0.03	55.3
26	0.58	0.07	60.2	0.00	0.19	76.0	0.00	0.22	88.1	0.00	0.11	71.7	0.09	0.04	68.2	0.15	0.03	50.7
27	0.18	0.10	64.9	0.00	0.21	80.9	0.00	0.20	83.2	0.00	0.13	72.3	0.00	0.08	83.0	0.00	0.05	57.2
28	0.42	0.05	56.0	0.00	0.15	75.5	0.00	0.13	79.2	0.00	0.16	73.7	0.00	0.05	75.1	0.36	0.02	54.5
29	0.17	0.09	63.3	0.00	0.14	68.6	0.00	0.17	81.2	0.00	0.09	67.9	0.00	0.06	74.3	0.03	0.02	60.3
30	0.05	0.09	65.7	0.00	0.19	70.2	0.00	0.15	77.1	0.00	0.11	71.8	0.00	0.09	83.4	0.34	0.02	52.8
31	0.19	0.12	70.7				0.00	0.11	70.0	0.08	0.05	62.8				0.10	0.03	57.3
	5.37	3.29	63.7	5.17	3.70	68.5	0.41	5.30	78.5	0.09	4.54	79.2	2.32	2.30	72.3	4.93	1.25	62.7

6th Month Irrigation Season(May - Oct)	
18.29	Rain - Total
20.38	ET - Total
70.82	High Temp - Avg

Weather | Water Accounts Only | WaterMeterAccountIndex | Pk Add Ph | Pk Alpha List | Pk Wtr Acct List | Sheet1

Waterbudget_Example 1ac sprturf [Compatibility Mode] - Microsoft Excel

This worksheet determines the baseline and the landscape water allowance (LWA) for a site based on its peak watering month.

The baseline is the amount of water required by the site during the peak watering month if watered at 100 percent of reference evapotranspiration (ET_o). The following formula is used to calculate the baseline:

$$Baseline = ET_o \times A \times C_u$$

Where:
ET_o = Local reference evapotranspiration (inches/month)
A = Landscaped area (square feet)
C_u = Conversion factor (0.6233 for results in gallons/month)

The LWA is the water allotment for the site. The following formula is used to calculate the LWA:

$$LWA = 0.70 \times Baseline$$

Where:
LWA = Landscape water allowance (gallons/month)
Baseline = ET_o x landscaped area x 0.6233

To calculate the Baseline and LWA for a site, enter the designed landscaped area and average monthly reference evapotranspiration for the site's peak watering month. (Enter data in white cells only.)

STEP 1A - ENTER THE LANDSCAPED AREA (A)

110,207 **Area of the designed landscape (square feet)**

STEP 1B - ENTER THE AVERAGE MONTHLY REFERENCE EVAPOTRANSPIRATION (ET_o)

5.30 **Average monthly reference ET (inches/month) for the site's peak watering month**

Obtain from Water Budget Data Finder at www.epa.gov/watersense/nhspecs/wb_data_finder.html

OUTPUT - BASELINE FOR THE SITE

364,087 **Monthly baseline (gallons/month) based on the site's peak watering month**

OUTPUT - WATER ALLOWANCE FOR THE SITE

254,861 **Monthly landscape water allowance (gallons/month) based on the site's peak watering month**

Part 1 - Baseline & LWA | Part 2 - LWR | Part 3 - Results

Waterbudget_tool_112509_Final - Microsoft Excel

WaterSense Single-Family New Home Specification: Water Budget Tool

This water budget tool shall be used to determine if the designed landscape meets Criteria 4.1.1.1 of the specification.
Please refer to the WaterSense Water Budget Approach for additional information.

Your Name:	Duniway Park
Builder Name:	City of Portland Parks
Lot Number/Street Address:	
City, State, Zip Code:	
Peak Watering Month:	July
Is an irrigation system being installed on this site?	no

This worksheet determines the monthly landscape water requirement (LWR) for a site based on its peak watering month.

The monthly LWR is the water requirement specific to the designed landscape. The sum of the LWRs for each hydrozone equals the site LWR.
The following formula is used to calculate the LWR for each hydrozone:

$$LWR_H = \frac{1}{DU_{LQ}} \times [(ET_o \times K_L) - R_a] \times A \times C_u$$

Where:
LWR_H = Landscape water requirement for the hydrozone (gallons/month)
DU_{LQ} = Lower quarter distribution uniformity
ET_o = Local reference evapotranspiration (inches/month)
K_L = Landscape coefficient for the type of plant in that hydrozone (dimensionless)
R_a =Allowable rainfall, designated by WaterSense as 25% of average peak monthly rainfall (R)
A = Area of the hydrozone (square feet)
C_u = Conversion factor (0.6233 for results in gallons/month)

To calculate the LWR for the site, enter the information requested below for the site's peak watering month. (Enter data in white cells only.)

STEP 2A - ENTER THE AVERAGE MONTHLY RAINFALL (R) AT THE SITE FOR THE PEAK WATERING MONTH IDENTIFIED IN PART 1

0.53 **Average monthly rainfall (inches/month) for the site's peak watering month**

Obtain from Water Budget Data Finder at www.epa.gov/watersense/nhspecs/wb_data_finder.html

STEP 2B - COMPLETE TABLE 1 BELOW (enter data in white cells only)

Enter the area of the hydrozone (square feet). The total area must equal the landscaped area entered in Step 1A.
Choose the plant type from the dropdown list (source data is displayed in Table 2).
Choose the irrigation type from the dropdown list (source data is displayed in Table 3; guidance is displayed in Table 4 and Table 5).

Table 1. Landscape Water Requirement

Zone	Hydrozone/Landscape Feature Area (sq. ft.)	Plant Type or Landscape Feature	Landscape Coefficient (K_L)	Irrigation Type	Distribution Uniformity (DU_{LQ})	LWR_H (gal/month)
1	110,207	Turfgrass - High water requirement	0.8	Micro Spray	70%	403,097
2						-
3						-
4						-
5						-
6						-
7						-
8						-
9						-
10						-
11						-
12						-
13						-
14						-
15						-
Total Area =	110,207	Landscape Water Requirement for the Site (gal/month)				403,097

Table 2. Plant Type or Landscape Feature and Associated Landscape Coefficient

Plant Type or Landscape Feature	K_L Water Requirements		
	Low	Medium	High
Trees	0.2	0.5	0.9
Shrubs	0.2	0.5	0.7
Groundcover	0.2	0.5	0.7
Turfgrass	0.6	0.7	0.8
Pool, Spa, or Water Feature	0.8		
Permeable Hardscape	0		
Nonvegetated Softscape	0		

Source: Based on LEED for Homes Rating System 2008.

Table 3. Distribution Uniformity

Irrigation Type	$DU_{(LQ)}$ or EU*
Drip - Standard	70%
Drip - Press Comp	90%
Fixed Spray	65%
Micro Spray	70%
Rotor	70%
No Irrigation	NA

*Lower quarter distribution uniformity (DU_{LQ}) applies to sprinkler zones and emission uniformity (EU) applies to drip/microirrigation zones.
Source: (The Irrigation Association, October 2001) in Landscape Irrigation Scheduling and Water Management, IA 2005.

Table 4. Appropriate Irrigation Types - Landscaped Areas with Irrigation Systems

IF THE PLANT TYPE IS:	THEN THE IRRIGATION TYPE CAN BE:			
	Drip - Standard	Drip - Press Comp	Fixed Spray	Micro Spray*
Trees	x	x		x
Shrubs	x	x		x
Groundcover	x	x		x
Turfgrass	x	x	x	x

* Micro spray may only be used on vegetation other than turfgrass if it meets the definition of microirrigation system, which according to the *2009 WaterSense Single-Family New Home Specification* is: "The frequent application of small

Example 5 acre Park is determined to have 130,680 sq ft of Turf Grass

The WA = 584,455
The WR = 485,543
The WU = _____

IRRIGATION APPLIED WATER USE CALCULATOR / TRACKER

in us gallons

		Sq Ft		WA	NonScheduled Allowance		
Irrig Acres	2.53	110207		90%	68700	10%	
Mtr Rd Date	ET period	BaseMax	Mtr Use		Wtr Req	Adj Use	↓↑ %
15-Jul	2.81	193024	192984				
12-Aug	3.95	271333	292466				
15-Sep	4.46	306366	204204				
Total Season	11.22	770723	689654	693651	624951	620954	-1%

IRRIGATION APPLIED WATER USE CALCULATOR / TRACKER

in us gallons

Utilize the same form to establish annual usage goals & track progression through season

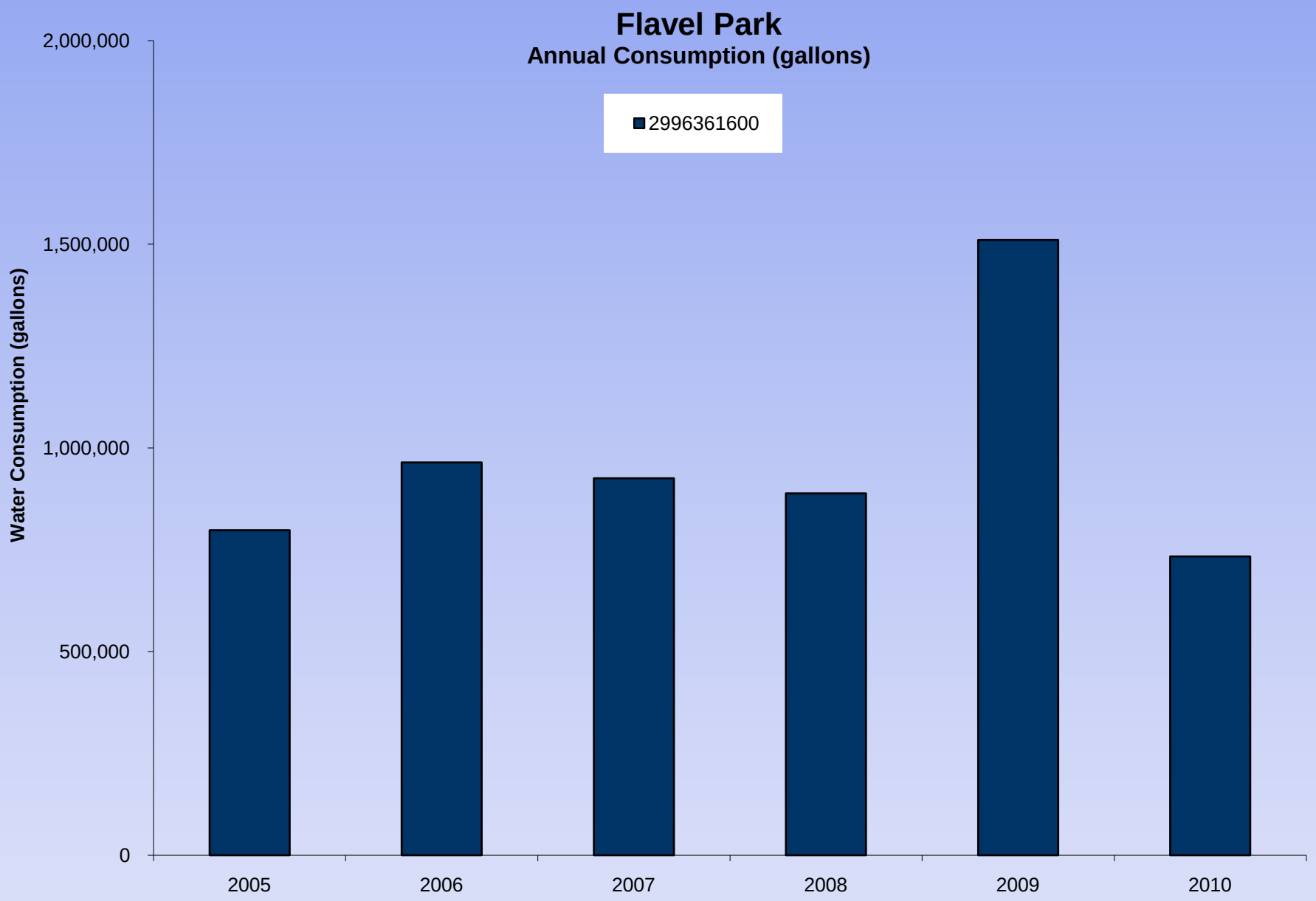
		Sq Ft		WA	NonScheduled Allowance		
Irrig Acres	2.53	110207		90%	68700	10%	
Mtr Rd Date	ET period	BaseMax	Mtr Use		Wtr Req	Adj Use	↓↑ %
15-Jul	2.81	193024	180000				
12-Aug	3.95	271333	225000				
15-Sep	4.46	306366	245000				
Total Season	11.22	770723	650000	693651	624951	581300	-7%

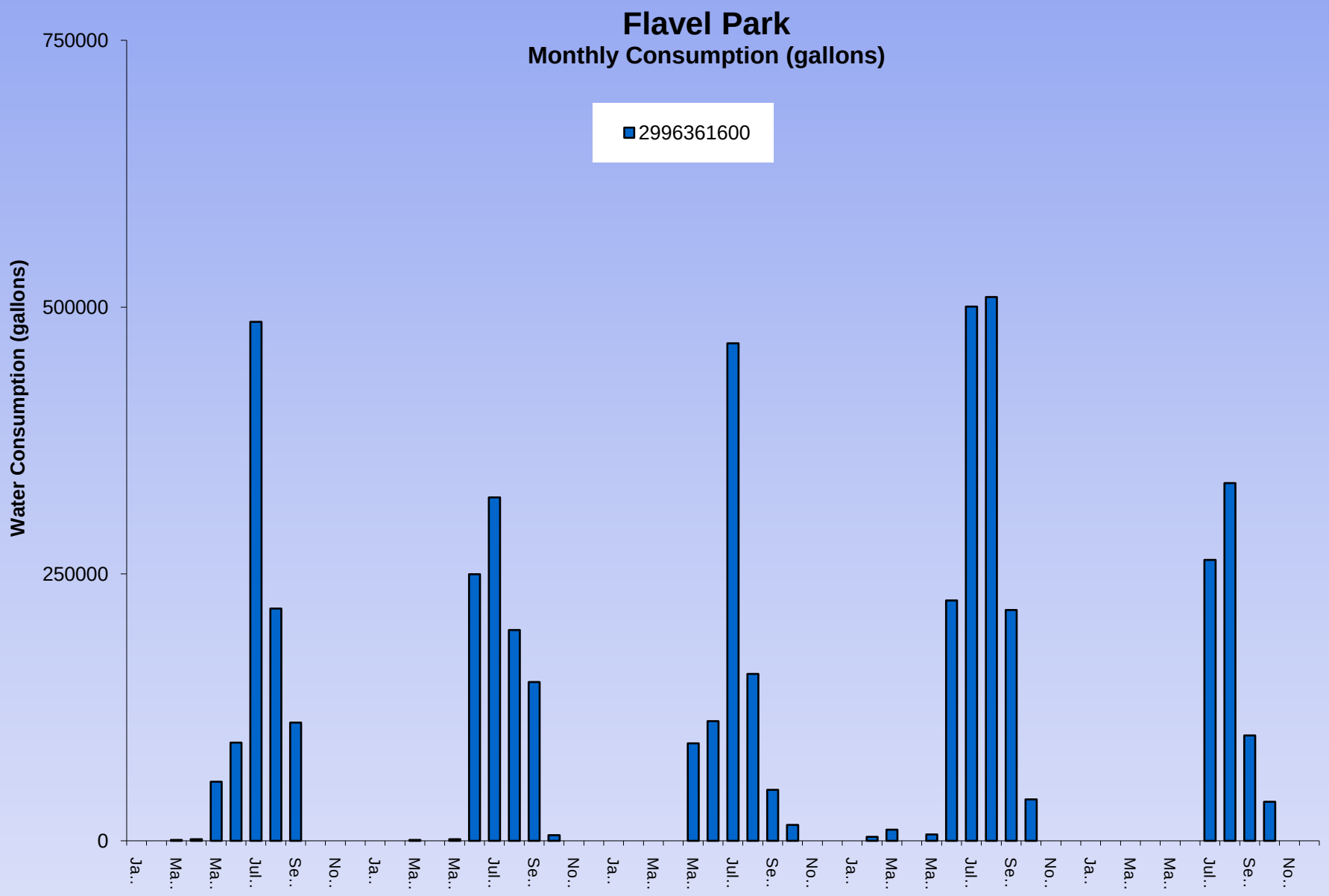
Indicator Park – CIC / ET

2.05 Acres / 89,298 sq. ft

8 zones

Turf Renovation – Fall 2010


Flavel Park
Annual Consumption (gallons)
2996361600
Water Consumption (gallons)
2,000,000
1,500,000
1,000,000
500,000
0
2005
2006
2007
2008
2009
2010


Flavel Park
Monthly Consumption (gallons)
2996361600
Water Consumption (gallons)
750000
500000
250000
0
Ja..
Ma..
Ma..
Jul..
Se..
No..
Ja..
Ma..
Ma..
Jul..
Se..
No..
Ja..
Ma..
Ma..
Jul..
Se..
No..
Ja..
Ma..
Ma..
Jul..
Se..
No..
Ja..
Ma..
Ma..
Jul..
Se..
No..

Additional Workbook Components

Park Specific

Schedule Development

Product Performance Information

Walk & Talk Check List

Maintaining Focus

Peer to Peer Recognition

Newsletter with help tips, reminders and tracking info

Keeping it in the forefront and exciting

Irrigation Services

Volume 1, Issue 1

February 4th, 2011

WACII News

PORTLAND PARKS & RECREATION

Healthy Parks, Healthy Portland

The Week Ahead in Weather

	M	T	W	T	F	S	S
H Temp	70	72	76	85	80	76	74
ET	.20	.21	.22	.24	.22	.22	.22
Rain	0	0	0	0	0	0	0

Special points of interest:

- Challenge Parks
- Indicator Parks
- Water Allocations
- The Toolbox
- Reaction Data

2011 Water Allocation Challenge

This year finds us faced with yet again a challenging budget. With this in mind, the 2011 irrigation season will be a test of wills.

Will we use more water than our budgets allow? Will June bring enough rainfall to maintain the green in our parks into July? Will you be able to utilize all the tools at your finger tips to manage your irrigation systems?

Let's hope for a no, maybe and a yes—in that order!

This newsletter will serve as one of the tools available, being produced on a weekly basis, to provide current water usage

Summing up

Develop Position to Read meters and lend assistance through Irrigation Season

Provide Weekly Feedback on Water Use and Designated Area performance – meeting preset acceptable levels for public use.

Crunch the Numbers and Provide a Water Requirement Amount

Water Reduction PDX

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PORTLAND
PARKS & RECREATION
Healthy Parks, Healthy Portland

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