WATER QUALITY AND USE

Beneficial Use Attainment

The Platte River, including all of its tributaries, is classified for aquatic use, livestock watering, and wildlife use. The Platte River, 102 River, and Little Platte River, including Smithville Lake are also classified for drinking water use and irrigation. Smithville Lake also has classifications for boating and whole body contact (MDNR 1986a). Minor elevations in fecal coliform bacteria levels in lake arms following runoff may occur in Smithville Lake (MDNR 1995). However, whole body contact recreation should remain unaffected.

Water quality that maintains diverse aquatic communities and acceptable fisheries uses throughout the basin should remain adequate, though biomass and biotic diversity may be limited in various streams within the basin due to high levels of non-point suspended solids, sedimentation, occasional low dissolved oxygen, increased nutrification, and in short reaches, by point source pollution. Water quality for livestock and wildlife watering should remain satisfactory within the basin. Water quality of drinking supply sources should also remain adequate. Manganese and iron may pose occasional taste, odor, and staining problems if not adequately removed by conventional water treatment or if water is drawn from deep strata of Smithville Lake. Taste and odor may also be a problem if algal growth is excessive (MDNR 1995).

Chemical Quality of Stream Flow

Suspended sediment, elevated water temperatures, and acidic inflows are water quality problems affecting streams within the Platte River basin, and all are negatively affected by weak base flows. High levels of suspended sediments in runoff are a significant contributor to the low aquatic diversity associated with basin streams. Basin streams often have manganese and fecal coliform levels that are commonly above Missouri water quality criteria (USDA-SCS 1982). Elevated water temperatures are harmful to fish survival and diversity. Water temperatures in excess of 90° F have been recorded in basin streams. These temperatures are found to be detrimental to the growth of largemouth bass, freshwater drum, bluegill, and crappie. Temperatures in excess of 80° F are found to be damaging to spawning and egg development of channel catfish, buffalo, and gizzard shad (USDA-SCS 1982). Due to the shallow nature and weak base flows in basin streams, water temperatures in excess of 80° F probably occur frequently during fish spawning and egg development (USDA-SCS 1982). Current trends show an increase in nitrate levels within basin streams, and this is thought to be associated with increased runoff of nitrogen-based fertilizers or increased runoff of animal waste (MDNR 1986b). Two years of water quality data from the gaging station at Sharps Station near Platte City are presented in Table 11.

Contaminants , Fish Kills, and Health Advisories

Since 1985, the Missouri Department of Health has issued a fish consumption advisory for Missouri, excluding the Ozarks (MDOH 1996). This advisory includes the Platte River basin. Consumption of fatty fishes such as catfish, common carp, suckers, freshwater drum, and paddlefish should be limited to no more than one pound per week (less than one pound per week

for pregnant or nursing females and young children) due to higher levels of contaminants found in these types of fish. No consumption advisories apply for bass, sunfish, crappie or walleye (MDOH 1996). No fish consumption advisories are posted for the Iowa portion of the basin (R. Currier, Iowa Department of Health, personal communication).

Contaminant samples collected from Smithville Lake in 1994 showed that chlordane levels exceeded the National Academy of Science/National Academy of Engineering (NAS/NAE) 1973 chlordane guidelines for protection of wildlife (100 parts per billion, ppb), but fell below the Food and Drug Administration action level of 300 ppb. Only chlordane exceeded the NAS/NAE guidelines for protection of wildlife based on the 28 contaminants sampled (Buchanan 1994). Numerous fish kills have occurred throughout the basin, and these have been attributed to naturally occurring conditions. Some of the larger fish kills have resulted from low dissolved oxygen levels associated with low flow conditions and increased water temperatures (Duchrow 1994). These conditions undoubtedly occur basin-wide. In addition, results may be magnified due to increased sedimentation and low base flows caused by channelization and detrimental agricultural practices (MDNR 1995).

Another threat to fish populations throughout the basin has been the improper management of municipal sewage and the subsequent runoff into receiving streams. Historically, this has been a chronic problem with the cities of Maryville and St. Joseph. Until 1971, the city of Maryville operated two primary sewage treatment plants, both located on tributaries to the 102 River. These facilities were responsible for several fish kills, the largest of which killed an estimated 250 fish and affected seven miles of the 102 River in 1971. In 1970, Maryville constructed five new sewage lagoons and shut down the existing plants. Pollution in the two tributaries and the 102 River ceased, and the present discharge has no apparent adverse effects on stream fauna. The eastern one-fourth of St. Joseph is drained by the Platte River basin, and at one time, 15 miles of small streams and 12 miles of the Platte and 102 rivers within this portion of the basin were considered to be grossly polluted from untreated municipal sewage runoff (MDC files). Although no documented fish kills were directly linked to sewage treatment plant (STP) discharges, the problems below the St. Joseph plants continued to be documented through 1981. Currently, the city of St. Joseph operates one STP within the Platte River basin, and no fish kills have been attributed to its effluent. A listing of municipal STP's and other permitted point pollution sources can be found in Tables 12 and 13.

Fish kills associated with runway de-icing using ethylene glycol and industrial effluent from Kansas City International Airport as well as municipal effluent from the Kansas City -Todd Creek STP have been a chronic problem in Todd Creek since 1976. This situation currently requires monitoring for metals and should be carefully reviewed for possible toxic effects (MDNR 1995). Enforcement actions may be forthcoming if violations continue (Duchrow 1994).

Another concern to fish populations within the Platte River basin is runoff of livestock manure, both from ranging animals and concentrated feedlot sources. Large documented fish kills have not been directly linked to livestock waste runoff in the basin. However, this is a concern due to

recent fish kills in northwest Missouri caused by livestock manure spills from concentrated animal feeding operations (CAFO's) in other river basins.

Norris and Sons Trash Service and the city of St. Joseph operate landfills near Pigeon Hill Conservation Area in Buchanan County. Leachate from these landfills has been responsible for past fish kills, and has been a noted contributor of pollutants to Pigeon Creek. The original landfill was constructed directly over a tributary to Pigeon Creek, and was responsible for most of the problems. Today both landfills are under state regulations, and safe operating guidelines have been put into place that should alleviate further problems. Four companies (Amoco, Mapco, Platte Crude, and Williams Brothers) maintain oil pipelines that underlie streams within the basin. These pipelines present a potential hazard for aquatic populations should a break occur.

Water Use

A. **Municipal-** Within the Missouri portion of the Platte River basin there are four surface water intakes designated for municipal use (Figure ws). Two surface water intakes are located on Smithville Lake and serve the cities of Smithville and Plattsburg. One is located on Mozingo Lake and serves the city of Maryville. The other municipal surface water intake within the Missouri portion of the basin draws directly from the 102 River and serves the city of Maryville (MDNR 1996).

The Iowa portion of the Platte River basin contains three surface water intakes for municipal use (Figure ws). Two of the surface water intakes are located on reservoirs and serve the cities of Lennox and Bedford. The other surface water intake is located on the 102 River at Bedford and serves as a backup system (J. Riessen, IADNR, personal communication).

B. **Agricultural-** Water use for irrigation purposes in the Missouri portion of the basin is minimal, although it varies annually depending upon rainfall. Only two of the nine Missouri counties within the basin (Andrew and Platte) reported any water use for irrigation (range 0.1 to 99 million gallons) during 1984 (MDNR 1986a).

Point-Source Pollution

Municipal sewage treatment plants are the major point-source pollution concern within the basin (Table 12; Figure st). Surveys directly below basin STP's have noted changes in fish and invertebrate quantity and quality, increased turbidity, and lowered beneficial use potentials. Improperly treated waste water has the potential to add excessive nutrients, elevate ammonia levels, increase levels of fecal coliform bacteria, and cause low levels of dissolved oxygen in receiving streams. Approximately 10 miles of stream (near the metropolitan areas of St. Joseph and Maryville) in the basin are thought to be negatively impacted by sewage effluent. These discharges have been responsible for severe stream degradation in the past. Currently STP's are monitored regularly and come under the scrutiny of National Pollution Discharge Elimination System (NPDES) permits. Non-municipal sewage effluent does not have large negative impacts on basin streams (MDNR 1995).

Unauthorized discharge from lagoons or pits serving CAFO's is another potential point-source pollutant within the basin. These discharges have been responsible for extensive fish kills in north Missouri, although no spills of this type have been documented as causing fish kills in the Platte River basin. Currently there are 75 CAFO's permitted within the basin, and it has been estimated that they generate 3,013,047 PE (human population equivalent) of waste annually (MDNR 1996 data). A listing of active and proposed CAFO's within the entire basin can be found in Table 14.

Non-Point Source Pollution

Non-point source pollution has the greatest negative influence upon water quality within the Platte River basin. The most common problems associated with non-point sources are low dissolved oxygen, high levels of turbidity, and organic nutrients, all of which are influenced by excessive runoff and extended low flows. The major factors contributing to non-point source pollution include channelization, intensive row cropping, and livestock (MDNR 1995). Urban construction and runoff may negatively affect basin streams in the Kansas City and St. Joseph areas (MDNR 1995).

Land use within the basin is dominated by row cropping and grazing of pasture land. One effect of intensive row cropping is increased runoff. This leads to increases in both upland and stream bank erosion and delivers high sediment loads and agricultural chemicals directly to basin streams. It is estimated that 23 tons of soil per acre are lost annually using straight row cropping with conventional tillage. Soil losses due to sheet and rill erosion on untilled uplands is 11 tons per acre annually. Gully erosion occurs at a rate of 1.2 tons per acre annually. This rapid erosion results in increased turbidity, degraded aquatic habitat, and increased nutrient and pesticide loads into streams (MDNR 1995). The Conservation Reserve Program (CRP) has removed some of the highly erodible land from production, but most of these CRP contracts will expire by 1998. Under the 1996 farm bill it has been estimated that erosion rates in northwest Missouri may rise from 10 to 40 percent as these highly erodible lands return to production (Otte 1996).

Livestock continues to be the main non-point source of organic nutrients to basin streams (MDNR 1995). The total number of livestock within the basin is estimated to equal 4,017,858 PE (T. Barney, USDA-NRCS, personal communication). The extent to which water quality, and subsequently aquatic life, is negatively affected by animal waste is difficult to estimate. The lack of adequate vegetation or buffer strips between feedlots or holding facilities and the stream allows runoff to carry waste and soil directly to streams. Direct access to streams by cattle is another major non-point pollution source within the basin. Excessive or untimely land application of animal waste can also add pollutants to basin streams. All of these situations can result in increases in sedimentation, fecal coliform bacteria, phosphorus, nitrates, ammonia nitrogen, and lowered dissolved oxygen (MDNR 1989).

Table 11. Selected water-quality for the Platte River at Sharps Station, MO at gage station 06821190, water years 1986 and 1994 (USGS 1987; USGS 1994; Missouri Code of State Regulations 10 CSR 20.7).

	State Standard				Water Year	Water Year
Parameter	**I**	**III**	**VI**	**VII**	**1986**	**1994**
Temperature (Deg. F)	90 deg max				33.8-80.6	45.5-82.4
Specific Conductance (us/cm)					137-394	307-406
Turbidity (NTU)					8.1-750	33-63
Oxygen, dissolved (mg/l)	5				5.1-15.6	7.0-13.7
Coliform, fecal (Cols./100ml)				200-storm runoff	600[K]-23,000	44-410[K]
Streptococci, fecal (Cols./100ml)					3200[K]-35000	52-2300[K]
Total hardness (mg/l) $CACO_3$					54-190	130-180
Nitogen, total ammonia + organic (mg/l as N)	dependent on pH and temp.				0.70-2.1	1.2-4.6
Phosphorus, total (mg/l as P)					0.090-0.550	0.200-0.300
Manganese, dissolved (ug/l as Mn)		50		50	170-440	54-190
Iron, dissolved (mg/l as Fe)	1,000	300		300	18-100	6-18

K: Non-ideal count of colonies (e.g., sample was not diluted enough, colonies merged)
I: Protection of aquatic life
III: Drinking water supply
VI: Whole body-contact recreation
VII: Groundwater

Table 12. Municipal sewage treatment plants (STP's) within the Platte River basin (MDNR and IADNR 1996 data) .

Facility Name	Receiving Stream	Flow** (MGD)	Type	Location T R S
Gower STP	Jenkins Branch	0.119	3 Cell Lagoon	55N 33W 04
St. Joe, Faraon St. STP	102 River	0.414	2 Cell Lagoon	57N 34W 07
K.C., Northland STP	Wilkerson Creek	0.030	Extended Aeration Activated Sludge	52N 32W 19
K.C., Rocky Branch STP	Rocky Branch Creek	0.745	Contact Stabilization 2 Cell Lagoon	52N 33W 11
Smithville STP	Little Platte River	0.090	2 Cell Aerated Primary	53N 33W 22
Plattsburg STP	Smithville Reservoir	0.200	Trickling Filter	55N 32W 25
Trimble STP	Dicks Creek	*	Currently Unsewered Under Construction	54N 33W 26
Clarksdale STP	Third Fork	*	Currently Unsewered Under Construction	58N 32W 30
King City STP	Little Third Fork	0.080	2 Cell Lagoon	60N 32W 08
Stewartsville STP	Castile Creek	0.105	3 Cell Lagoon	57N 32W 21
Union Star STP	Third Fork	0.032	3 Cell Lagoon	60N 33W 34
Barnard STP	102 River	0.008	3 Cell Lagoon	62N 35W 15
Conception Junction STP	Platte River	0.008	3 Cell Lagoon Sludge Lagoon	63N 34W 14
Hopkins STP	Middle Fork 102 R.	0.060	3 Cell Lagoon	66N 35W 02
Maryville STP	102 River	1.400	5 Cell Aerated Lagoon	64N 35W 22
Ravenwood STP	Platte River	0.003	2 Cell Lagoon Sludge Lagoon	64N 34W 13
Edgerton STP	Grove Creek	0.016	2 Cell Lagoon	54N 33W 08
K.C., Todd Creek STP	Todd Creek	1.200	Contact Stabilization Sludge Lagoon	52N 34W 01
Platte City STP	Platte River	0.250	Extended Aeration Activated Sludge	53N 35W 35
Tracy STP	Trib. to Platte River	0.009	Extended Aeration	53N 35W 23
Clearfield STP	Turkey Creek	*	Waste Stabilization Lagoon	69N 31W 06
Lenox STP	Middle Br. 102 River	*	Aerated Lagoon	70N 32W 07
Bedford STP	East Fork 102 River	*	Trickling filter	68N 34W 26
New Market STP	West Fork 102 River	*	Waste Stabilization Lagoon	69N 35W 32
Creston STP	Trib. to Platte River	*	Trickling Filter	72N 31W 01
Cromwell STP	West Fork Platte River	*	Waste Stabilization Lagoon	72N 31W 07

***information not available, ** MGD = Millions of gallons per day**

Table 13. Permitted point pollution sources in the Missouri portion of the Platte River basin (MDNR 1997 data).

Facility Name	Receiving Stream	Location (T R S)	County
Midwest Acres Inc.	Trib to 102 River	60N-35W-33	Andrew
Marcum Oil and Gas	Trib to 102 River	59N-35W-09	Andrew
MMA, Flag Springs Quarry	Trib to 102 River	60N-35W-24	Andrew
Herzog Red E Mix	102 River		Andrew
St. Joseph Wilburt	102 River		Andrew
Shady Lawn Rest Home	Long Branch	59N-34W-18	Andrew
North Andrew R-6	Kellog Branch	60N-35W-07	Andrew
Bolckow Water System	102 River	61N-35W-03	Andrew
Dishman Lime and Phosphorus	Niagara Creek	59N-33W-19	Andrew
Rea Grain and Feed Co.	Trib to Platte River	61N-34W-29	Andrew
Acoustics Dev. Corp.		52N-35W	Buchanan
Altec Industries Inc.	Trib to Platte River	57N-34W-03	Buchanan
Bessie Ellis School	Trib to Platte River	57N-34W-10	Buchanan
Boehringer Ingelheim	Trib to 102 River	57N-35W-02	Buchanan
Carriage Oaks II	Trib to 102 River	58N-35W-35	Buchanan
Cristgen 66	Trib to 102 River	57N-35W-11	Buchanan
Drury Conoco	Trib to 102 River	57N-35W-02	Buchanan
Green Acres Rest Home	Trib to 102 River	58N-35W-27	Buchanan
National Guard Shop	Trib to 102 River		Buchanan
Mitchell Woods Bus. Prk.	Trib to 102 River	57N-34W-17	Buchanan
Norris & Sons Transfer	Trib to 102 River	57N-35W-13	Buchanan
Purina Mills Inc.	Trib to 102 River	57N-35W-26	Buchanan
Richmond Screw Anchor	Trib to 102 River	57N-35W-25	Buchanan
St. Joe Sanitary Landfill	Pigeon Creek	56N-35W-13	Buchanan
Swiss Highlands	Trib to 102 River	58N-35W-34	Buchanan
Woodbine Road Paving	Trib to 102 River	57N-34W-06	Buchanan
169 Hwy. Partnership	Trib to 102 River	57N-35W-25	Buchanan
Communities of Bristo	Little Platte River		Clay
Harborview 4th and 5th	Little Platte River	53N-33W-12	Clay
Little Platte Park	Little Platte River	53N-33W-12	Clay
Somerbrooke	Wilkerson Creek	52N-33W-26	Clay
Timber Court	Wilkerson Creek	52N-33W-26	Clay
Airy Acres Mobile Homes	Castile Creek	55N-33W-15	Clinton
AT&T Cable Removal	Castile Creek	55N-33W-01	Clinton
AT&T Cable Removal	Horse Fork	55N-31W-07	Clinton
AT&T Cable Removal	Little Platte River	55N-31W-08	Clinton
Centennial Acres	Grove Creek	54N-33W-15	Clinton
Everett Quarries	Trib to Platte River	55N-33W-32	Clinton
Everett Quarries	Little Platte River	55N-31W-30	Clinton
Everett Quarries	Little Platte River	55N-31W-29	Clinton
Sur-Gro,Plattsburg	Little Platte River	55N-32W-23	Clinton
United Coop	Little Platte River	55N-32W-23	Clinton
Waste Water Collection	Trib to Platte River	54N-33W-26	Clinton

Table 13, continued.

Facility Name	Receiving Stream	Location (T R S)	County
MFA Oil Co.	Elm Grove Branch	61N-32W-32	Gentry
Sur-Gro, King City	Elm Grove Branch	61N-32W-32	Gentry
Conoco All-Pro	White Cloud Creek	64N-36W-14	Nodaway
Gray Oil & Gasoline	White Cloud Creek	65N-35W-31	Nodaway
Kawasaki Motors Mfg.	White Cloud Creek		Nodaway
Laclede Chain Mfg.	Trib to 102 River		Nodaway
LMP Steel and Wire Mfg.	Trib to 102 River		Nodaway
Maryville Sanitary Landfill	White Cloud Creek	64N-35W-07	Nodaway
Metal Culverts, Maryville	Trib to 102 River		Nodaway
MFA Agri-Service	Trib to Platte River	63N-34W-14	Nodaway
MFA Bulk Storage	Trib to 102 River	64N-35W-07	Nodaway
Barnard Quarry	Trib to 102 River	62N-35W-09	Nodaway
Gooden Quarry	Trib to Platte River	65N-33W-31	Nodaway
Mount Alverno	Trib to Platte River	64N-34W-14	Nodaway
Nodaway Worth Elec.	Trib to Platte River	64N-34W-23	Nodaway
Airworld Center	Todd Creek	52N-34W-25	Platte
Basswood Country RV	Little Platte River	53N-34W-27	Platte
Choice Properties	Second Creek	52N-34W-36	Platte
Citicorp Credit Service	Second Creek	52N-34W-25	Platte
Conoco Portable	Todd Creek	52N-34W-15	Platte
Coves North 13th	Second Creek	51N-33W-08	Platte
Erie Strayer Central	Prairie Creek	52N-34W-09	Platte
Harley Davidson Mfg.	Todd Creek	52N-34W-24	Platte
Hunt Midwest	Todd Creek	53N-34W-36	Platte
Hunt Midwest	Todd Creek	52N-34W-02	Platte
K.C. International Air	Todd Creek	52N-34W-22	Platte
K.C. International Air	Todd Creek	52N-34W-34	Platte
Trans World Airlines	Todd Creek	52N-34W-23	Platte
KCI Multipurpose Exp.	Prairie Creek	52N-34W-09	Platte
Kelly Crossing	Second Creek	51N-33W-18	Platte
Lakes at Oakmont	Prairie Creek	52N-34W-07	Platte
North American Auction	Platte Creek	53N-35W-11	Platte
Alan Acres	Second Creek	52N-33W-06	Platte
Platte Co. R-III Elementary	Trib to Platte River	53N-35W-36	Platte
Platte Co. Ready Mix	Trib to Platte River		Platte
Prairie View Plaza	Prairie Creek	52N-34W-06	Platte
Quick Trip #256	Trib to Platte River	53N-34W-31	Platte
Shiloh Golf Course	Trib to Platte River	53N-34W-33	Platte
Timber Creek	Second Creek	53N-33W-32	Platte
Timber Park	Prairie Creek	52N-34W-07	Platte
MFA Bulk Storage	Trib to Platte River	66N-33W	Worth
Sheridan Rural Rental	Trib to Platte River	66N-33W-15	Worth

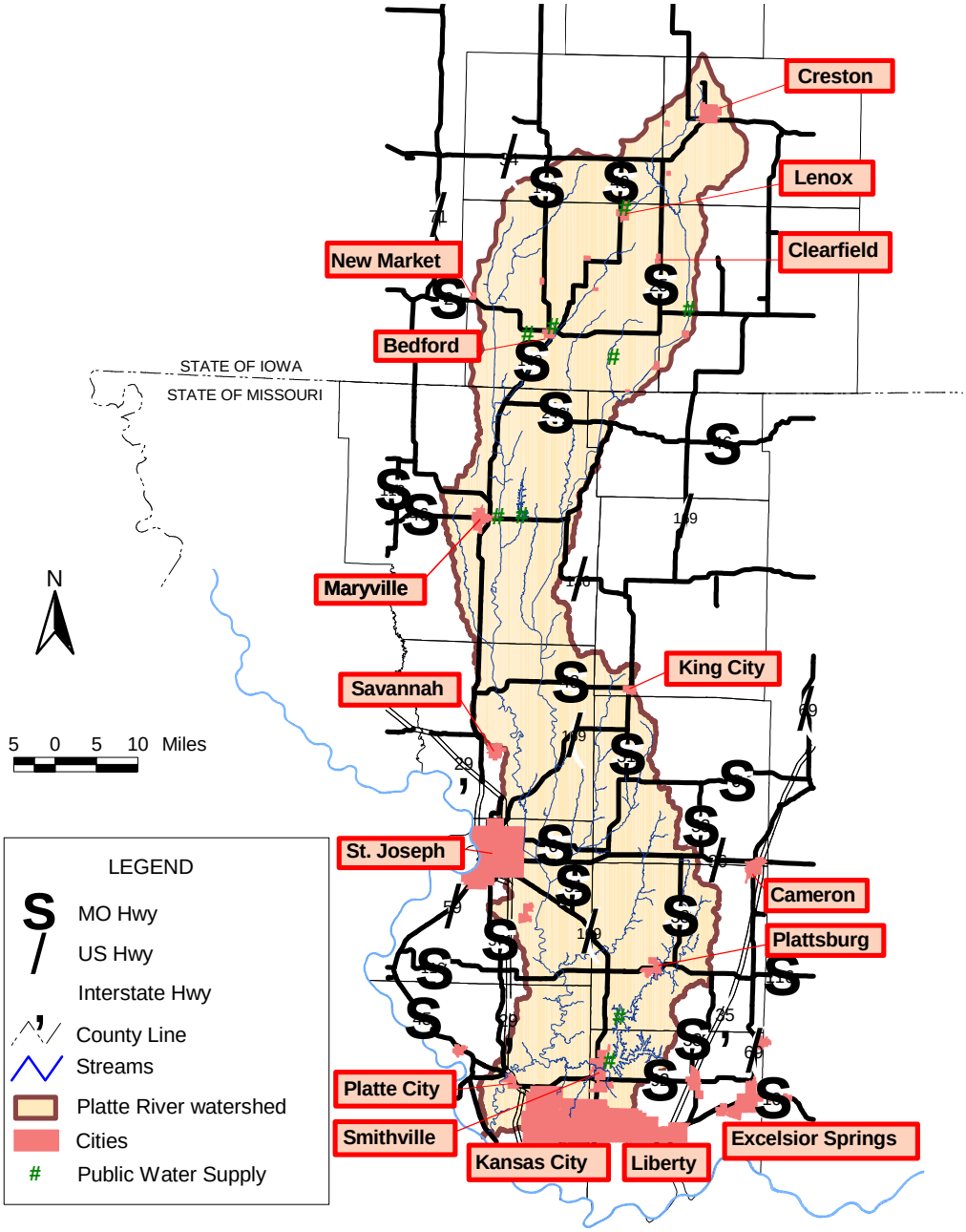

Figure ws. Water surface intake sites within the Platte River basin.

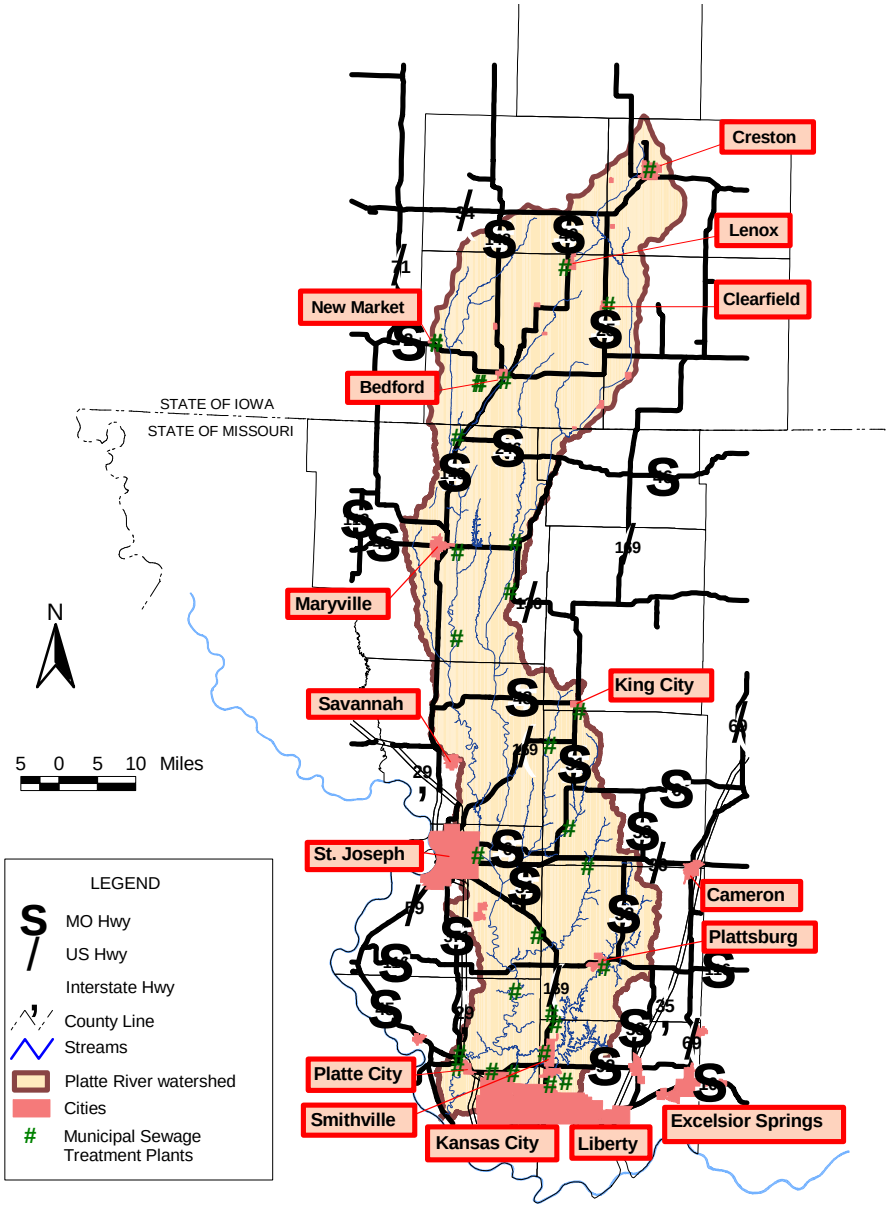

Figure st. Municipal sewage treatment sites within the Platte River basin.

Table 14. Permitted Concentrated Animal Feeding Operations (CAFO's) in the Platte River basin (MDNR and IADNR 1996 data).

Facility I.D.	County	Waste Type[1]	Animal Amount[2]	Population Equivalent	Facility Type	Location T R S
LA7000532	Andrew	SF	306	673		60N 33W 09
LA7000405	Andrew	SF	240	528		59N 33W 09
LA7102272	Andrew	SF	470	1,034	Aerobic Lagoon	59N 34W 21
LA7103771	Andrew	SS	40	1,449	Concrete Pit	60N 35W 33
ND7100153	Andrew	SN	500	1,100		60N 34W 30
LA7100026	Andrew	DM	80	1,840		58N 34W 17
LA7000539	Andrew	SS	400	2,395		60N 34W 31
LA7100828	Andrew	SF	650	1,430		59N 34W 29
LA7103774	Buchanan	PB	80,000	6,154	Dry Manure Storage, Compost	55N 34W 17
ND7100156	Buchanan	DM	140	3,220	Earth Manure Pit	57N 34W 36
LA7000389	Buchanan	DM	90	2,070		57N 34W 07
LA7101135	Buchanan	SF	600	1,320		57N 34W 08
LA7103637	Buchanan	SF	200	440		55N 33W 17
LA7103747	Buchanan	SS	32	231	Anaerobic Lagoon	56N 34W 35
LA7100007	Buchanan	DM	50	1,150		57N 34W 04
LA7000557	Buchanan	SS	24	108		57N 34W 14
LA7103755	Buchanan	SS	12	141	Anaerobic Lagoon	56N 33W 32
LA7100118	Clinton	SF	420	924		55N 32W 03
LA7100008	Clinton	SS	26	117		57N 31W 30
LA7000558	Clinton	SF	420	924		56N 31W 02
LA7100009	Clinton	SF	625	1,375		55N 32W 32
LA7000056	Clinton	SF	320	704		54N 33W 14
LA7000542	Clinton	SF	560	1,232		55N 31W 02
LA7100006	Clinton	SS	12	141		56N 33W 21
LA7000534	Clinton	DM	80	1,840		55N 33W 24
LA7103769	Clinton	SS	150	4,211		56N 33W 27

Table 14, continued.

Facility I.D.	County	Waste Type[1]	Animal Amount[2]	Population Equivalent	Facility Type	Location T R S
LA7103729	Clinton	SF	1,150	3,323	Concrete Pit	55N 32W 03
LA7103808	Clinton	SF	3,840	8,179	Anaerobic Lagoon	56N 31W 23
LA7102753	Clinton	SN	240	240		57N 31W 32
LA7102508	DeKalb	SS	24	444		60N 33W 26
LA7103758	DeKalb	DM	140	3,640	Anaerobic Lagoon	57N 33W 10
LA7103826	DeKalb	SS	75	1,700	Anaerobic Lagoon Concrete Pit	60N 32W 30
LA7103800	DeKalb	DM	400	3,360	Anaerobic Lagoon	57N 33W 11
LA7103739	DeKalb	PB	36,000	3,600	Dry Manure Storage	
LA7103813	DeKalb	PB	80,000	12,111	Dry Manure Storage, Compost	58N 22W 01
LA7103779	DeKalb	DM	120	3,406	Vegetative Filter	58N 32W 13
ND7100168	DeKalb	BF	125	2,542		58N 32W 09
LA7103748	DeKalb	SS	83	1,950	Anaerobic Lagoon	60N 32W 29
LA7000416	DeKalb	SF	170	374		59N 32W 04
LA7101253	DeKalb	SF	400			59N 32W 08
LA7000278	DeKalb	DM	90	2,070		58N 32W 25
ND7100524	Gentry	SF				61N 32W 21
LA7000279	Nodaway	SS	34	363		63N 35W 08
LA7000429	Nodaway	SS	40	180		63N 35W 23
LA7000212	Nodaway	SS	152			67N 36W 34
LA7102067	Nodaway	SS	16	72	Anaerobic Lagoon	65N 35W 02
LA7100021	Nodaway	SS	16	72	Earth Manure Pit	62N 34W 10
LA7000244	Nodaway	DM	135	3,105		64N 35W 31
LA7103806	Nodaway	SS	202	9,245	Dry Manure Storage, Anaerobic Lagoon	65N 35W 31
LA7000472	Nodaway	SN	200	140		65N 35W 09
LA7103746	Nodaway	SS	24	282	Anaerobic Lagoon	62N 35W 12
LA7000455	Nodaway	SF	750	1,848		63N 34W 17

Table 14, continued.

Facility I.D.	County	Waste Type[1]	Animal Amount[2]	Population Equivalent	Facility Type	Location T R S
LA7103762	Nodaway	SS		1,976	Anaerobic Lagoon Concrete Pit Vegetative Filter	64N 36W 22
LA7000078	Nodaway	SF	500	1,100		64N 36W 34
LA7100725	Nodaway	SF	800	1,760		67N 35W 36
LA7000094	Nodaway	SN	160	166		65N 33W 08
LA7103784	Nodaway	SF	1,800	4,050	Earth Manure Pit	64N 33W 31
LA7100800	Nodaway	SS	360	1,620		63N 34W 19
LA7000275	Nodaway	SF	240	440		63N 35W 19
LA7100020	Nodaway	SS	20	90	1 Cell Lagoon	63N 35W 19
LA7103791	Platte	SS	1,200	8,415	Anaerobic Lagoon	53N 33W 06
MOG010019	Platte	SS	192	8,415	Anaerobic Lagoon	53N 33W 06
LA7102633	Platte	DM	100	2,300	Anaerobic Lagoon	52N 33W 17
LA7100010	Platte	SS	30	369		54N 34W 20
ND7100319	Platte	SF	90	198	1 Cell Lagoon	54N 34W 31
LA7103735	Platte	SS	570	3,835	Concrete Pit	53N 33W 09
Iowa	Ringgold	SN	455,000	6,825	Lagoon	70N 31W 10
Iowa	Ringgold	SS	1,462,500	21,907	Lagoon	70N 31W 04
Iowa	Ringgold	SS	1,050,000	15,750	Lagoon	68N 31W 17
Iowa	Ringgold	SS	405, 000	6,075	Lagoon	68N 31W 31
Iowa	Taylor	SS	367,500	6,825	Basin Earthen	68N 32W 11
Iowa	Taylor	SF	455,000	5,513	Lagoon	69N 32W 36
Iowa	Taylor	SS	288,000	4,020	Basin Earthen	68N 32W 12
Iowa	Taylor	SS	1,920,000	28,800	Lagoon	69N 33W 15
Iowa	Taylor	SS	270,000	4,050	Basin Earthen	70N 33W 31

1. Waste Type: Beef feeding (BF); Dairy milking (DM); Poultry broiler (PB); Swine finishing (SF); Swine nursery of pigs (SN); Sows, boars, farrowing (SS).

2. Animal Amounts: Missouri amounts are listed in animal units. Iowa amounts are listed in pounds of live weight.