

THE MILLIKEN FLOOD
of
June 3, 1981
Weld County, Colorado

by
D. Randolph Seaholm

July, 1981

Colorado Water Conservation Board
1313 Sherman Street
Denver, Colorado 80203

Milliken Flood

June 3, 1981

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All photographs courtesy of photographer Karen Schulenburg
and the Loveland Daily Reporter-Herald.

Acknowledgements:

We wish to acknowledge the assistance and cooperation of the many agencies, firms, organizations and individuals listed below. Many town officials and private citizens provided valuable information that was essential to the understanding of the flooding problems in Milliken, Colorado. It is hoped through documentation of the June 3, 1981 flood event that a viable solution to the existing drainage problems will develop and greatly benefit the community.

The efforts of all those who contributed to this documentation are greatly appreciated.

Colorado Water Conservation Board

- Mr. Larry Lang

Town of Milliken

- Mr. Mervin Martin, Mayor
- Board of Trustees
- Ms. Nora Schiferel, Town Clerk
- Mr. Leroy Martinez, Town Superintendent
- Mr. Jerry Kilgore, Fire Chief
- Mr. Guy Orazeman, Police Chief

Loveland Daily Reporter-Herald

- Ms. Karen Schulenburg, Photographer
- Mr. Dave Albee, Reporter
- Mr. Mark Dowling, Reporter
- Ms. Becky Orr, Reporter

Individuals

- Mr. Gordon Cook, Postmaster
- Mr. Ehrlich, Farmer

Purpose

The purpose of this report is to document the flooding that occurred at Milliken, Colorado on June 3, 1981. It is hoped that this documentation will aid in the understanding of the drainage problems presently existing at Milliken and help develop viable solutions to the problems.

This report focuses on three small drainages and the related sediment and erosion problems associated with flooding on each. The drainage problems identified in figures 3, 4, and 5 were either field identifiable approximately 3 weeks after the flooding or were as reported to us by several individuals. This report does not attempt to identify all the related minor drainage problems.

Please keep in mind that we are discussing shallow flooding (generally less than 3 feet in depth) in this report. Generally speaking shallow flooding is not associated with loss of life or severe property damage, however, a small potential for such does exist.

Storm Conditions

On June 3, 1981 at approximately 3:30 p.m. a severe thunderstorm system produced as much as 3.5 inches of rain on an approximately seven square mile drainage southwest of Milliken, Colorado in little more than one hours time. This intense rain seemingly averaged between 2 and 2.5 inches over the entire basin in that hours time and caused considerable flooding in the town of Milliken and on adjacent farm lands as described later in this report.

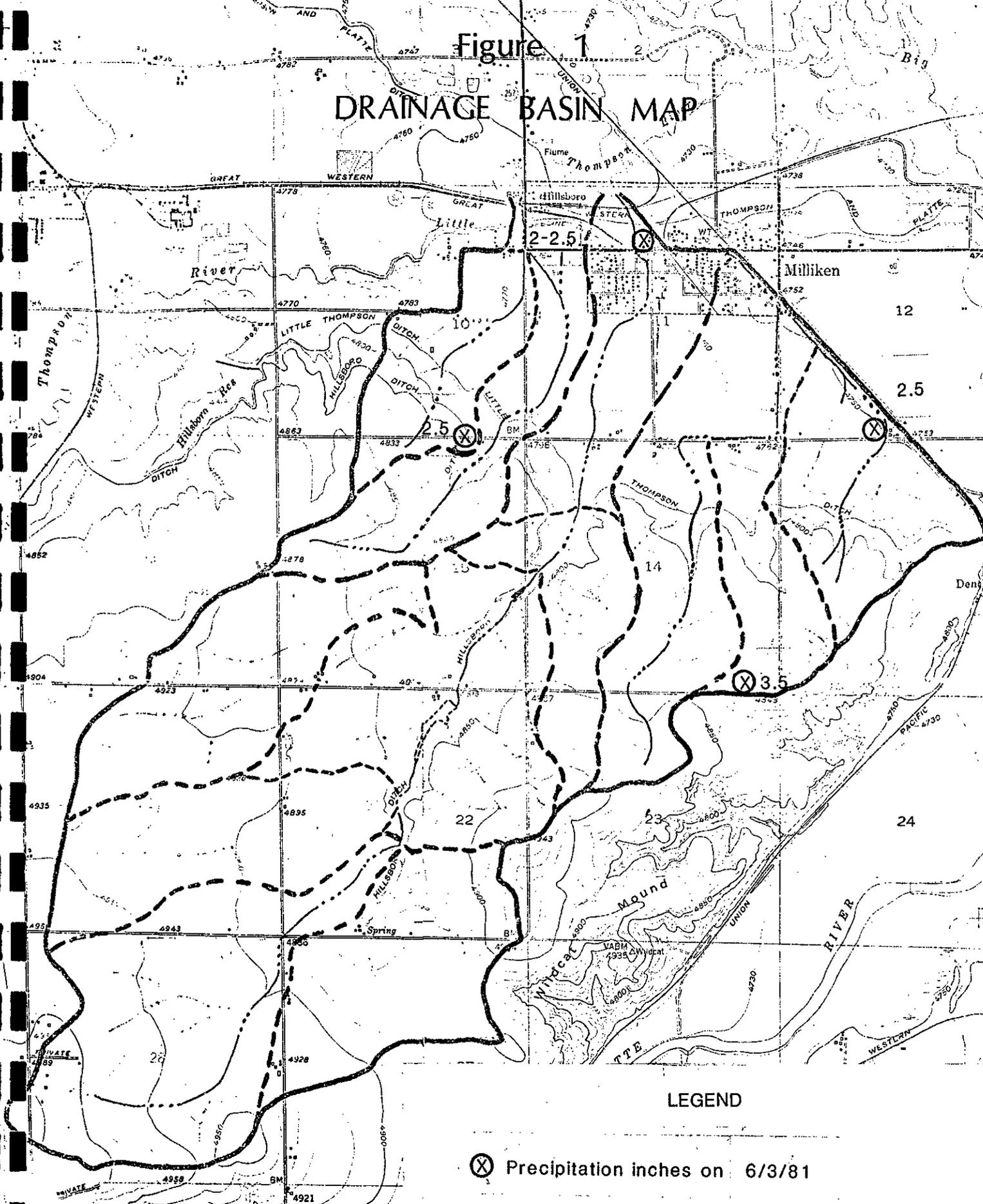
In addition to these heavy rains the storm system produced tornadoes and heavy hail in other areas. Considerable tornado damage was reported in Denver, Northglenn, Thorton, and Fort Lupton. Hail damage was reported along a line from Northglenn to Greeley and well on to the northeast at many scattered locations.

A 3.5 inch rainfall was reported on the Ehrlich land along Weld County Road 44 between Weld County Roads 21 and 23. A 2.5 inch rainfall was reported at the Ehrlich Farm House, Weld County Road 46 and the Union Pacific Railroad. Several residents in Milliken reported around 2.0 inches including Gordon Cook, the postmaster, and Guy Orazeman, the police chief, in about the same hours time. Leroy Martinez had almost 2.5 inches in his rain gage before hail broke it.

Based on these scattered reports it appears that the heaviest rainfall (3.5 inches) could have been nearly centered in the basin. The storm tracked from the southwest to the northeast

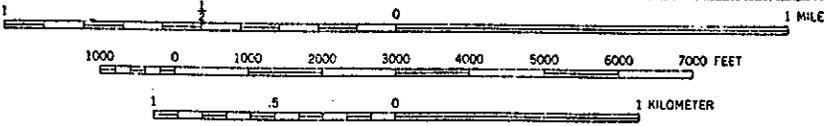
Figure 1

DRAINAGE BASIN MAP



LEGEND

⊗ Precipitation inches on 6/3/81



CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

down the main channel which increased the severity of flooding. Circled numbers on the basin map indicate approximate locations and amount of rainfall as reported by nearby residents.

Comparison of Storm Data

The table and graph in figure 2 were developed from data presented in the U.S. Weather Service publication "NOAA Atlas 2, Precipitation-Frequency Atlas of the Western United States, Volume III-Colorado." This table indicates that Milliken may have received a 100-year, 1-hour duration storm if the rainfall averaged 2.5 inches over the entire basin. A 2 inch rainfall over the entire basin represents around a 35-year, 1-hour duration storm. Thus, the flood outlines and problems identified in this report should fairly well indicate the hazards and problem areas which need to be corrected.

No estimated discharge values are available as clean-up operations have eliminated the high water marks necessary for such measurements.

Flood Hazards and Drainage Problems

The flooding on June 3, 1981 identified 3 main drainage problems for Milliken, Colorado. One drainage problem area is located on the east side of town between the Union Pacific Railroad Tracks and Cora Avenue. A pond up to six feet deep can develop during storms as indicated in figure 3 due to inadequate culvert capacity under the Union Pacific Railroad. Water continues to pond in this area until it can breakout over Dorothy Avenue and flow west, back towards the Lola Park tributary or washes out the U.P. tracks. This overflow also contributes in part to the flood problems experienced by some small business near the intersections of Frances and Highway 60. Adding to the problem is the load of fine sediments and fertilizers the waters pick up after washing predominately agricultural lands. It should also be noted that simply improving the culvert without increasing the drainage ditch capacity all the way to the river won't solve the total problem in this area but would merely transfer it farther downstream.

The second drainage problem area is located along the unnamed tributary running through Lola Park. As indicated in the pictures taken by photographer Karen Schulenburg of the Loveland Daily Reporter-Herald the water ponds behind and then overtops Forest, Elm and Broad Streets before dividing. Flood waters then either flow along the south side of Highway 60 (Broad street) to the Thompson and Platte ditch or overflow Highway 60 and run down through the trailer courts and into the Thompson and Platte ditch. If the Thompson and Platte ditch overtops the flood waters then flow northward and again pond in the open areas just south of the Great Western Railroad yards and there either evaporate or overflow the tracks and proceed on down to the

Figure 2
 Milliken, Colorado
 Precipitation Data

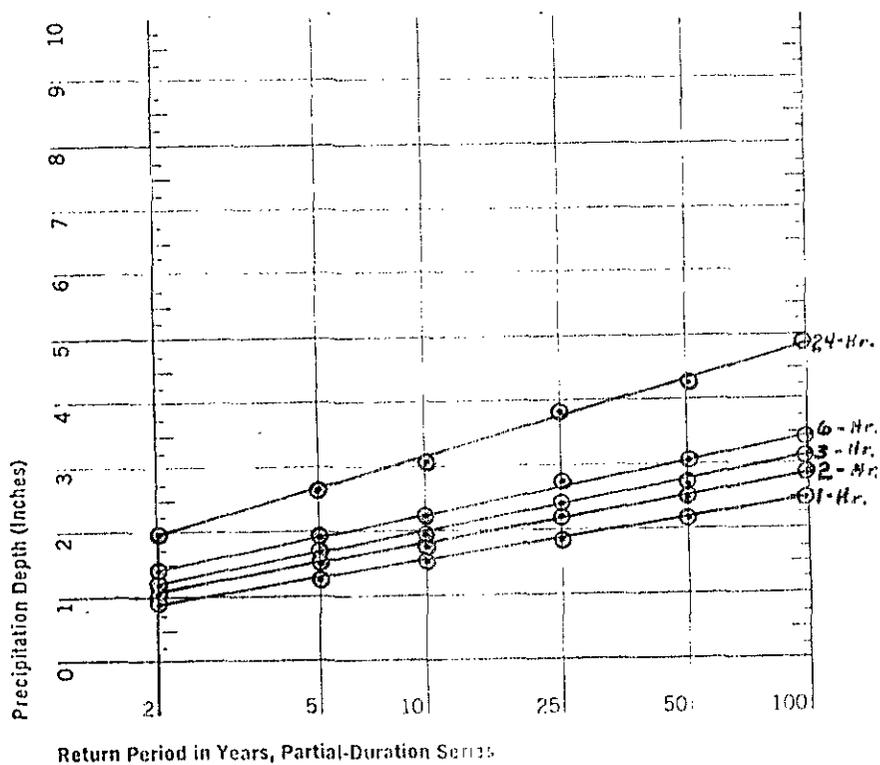
Depth - Duration - Frequency

Duration Frequency	1 Hour	2 Hour	3 Hour	6 Hour	24 Hour
2 Year	.89"	1.06"	1.18"	1.38"	1.93"
5 Year	1.25"	1.50"	1.67"	1.92"	2.62"
10 Year	1.52"	1.75"	1.95"	2.22"	3.06"
25 Year	1.85"	2.18"	2.42"	2.76"	3.80"
50 Year	2.15"	2.47"	2.70"	3.05"	4.25"
100 Year	2.50"	2.84"	3.08"	3.45"	4.79"

Notes: 1) Values were reduced based on approximately 7 square miles of drainage area. Reduction factors are as follows:

24 hour	98.8
6 hour	98.5
3 hour	97.8
2 hour	97.0
1 hour	95.5

2) All values derived from NOAA Atlas II-Colorado



Little Thompson River. Sedimentation is a problem in these ponding areas with large amounts usually deposited around the fire station. Sedimentation has also reportedly plugged a culvert under the Great Western Railroad Tracks.

The final drainage problem area is located in the vicinity of the elementary school. Runoff out of two relatively small sub-basins drains down and flows around either side of the elementary school and along County Road 21 (Quentine). The split flow then runs run off over the small bluff in several different directions. These flow splits cause significant erosion problems north of Broad Street along Qunetine, Pauline, Olive, Norma and Marjorie Avenues. Most of the runoff from these two basins was originally planned to flow into the Little Thompson via drainage waste ditches along County Road 21 (Quentine Avenue). However, these ditches have not been properly maintained over the years and grade of roads and intersections have limited their usefulness.

One complicating factor to the analysis of drainage problems in Milliken is the affect of the Little Thompson (Hillsboro) Irrigation Ditch, which comes out of Hillsboro Reservoir, upon flood flows originating in the upper basin. During smaller storms this ditch could divert most of the excess flows out of the basin into a sump near the Dent railroad junction. However, during large storms this ditch clogs up with sediment forcing flood flows to spread out along the ditch and then overtop. This causes flood runoff in areas which normally are not anticipated and once this runoff is out onto the relatively flat farm lands just south of town it can easily split and find its way into any one of the three main intermittent streams.

Damages

According to the Reporter-Herald, Milliken Fire Chief Jerry Kilgore, "estimated that the flooding caused at least \$5,000 damage." Most of the damage was caused by standing water, which flooded several homes and businesses, and the deposition of large amounts of sediment. The only notable exception to this was the street erosion that occurred near the elementary school. Also, portions of driveways were washed out in the street erosion area as well.

The primary recovery costs involved clean-up expenses and repair of erosion damage. No major structural damages were noted anywhere in town and there were no injuries or deaths.

Solutions for Investigations:

The biggest single drainage problem at Milliken is the lack of a well defined drainage path to the Little Thompson River. The solution to Milliken's drainage problems involve acquisition, development and maintenance of a well defined drainage path to the Little Thompson river. This solution will require at least

two separate right-of-ways and could also be handled fairly easily with three. The paving of streets and inclusion of curbs and gutters will help eliminate most of the erosion problems by the elementary school, however it is probably not necessary throughout the town if not desired. Any new drainage ditches must be self cleaning and thus ditch grades are critical because of the sediment load involved. It will also be very important to get the railroads, state highway department, county and ditch companies involved as well as the community if these problems are to be completely solved.

DRS/gl

Reporter-Herald

102nd YEAR

LOVELAND, COLORADO 80537 (U.S.P.S. 321-020)

THURSDAY, JUNE 4, 1981

NO. 133

28 PAGES

25¢

Storm empties on Weld County

By MARK DOWLING
and BECKY ORR

A tornado-laden storm system that ripped through suburban Denver Wednesday afternoon dumped heavy rain and hail on western Weld County, causing flash flooding and thousands of dollars damage to crops and property.

Although funnel-cloud sightings were reported throughout the area, a tornado hit only Fort Lupton. It reportedly damaged 13 houses, a church, and slightly injured one person.

Between .095 and 2 inches of rain were reported in Weld County in a little more than an hour.

The Colorado State Patrol said seven funnel clouds touched down in Weld County and several other unconfirmed reports were received throughout the afternoon. However, since a funnel cloud is considered a tornado only when it touches the ground, they were not reported as twisters.

Four funnel clouds were also reported near Longmont.

Three tornadoes hit Fort Lupton around 3:30 p.m., and one funnel dipped into an open field between Milliken and Johnstown. Another tornado reportedly touched down seven miles west of Greeley at about 3:50 p.m., CSP Dispatcher Wilbur Walters said.

Heavy rain flooded several Weld County roads, resulting in their closure. The U.S. 34 Bypass west of Greeley was closed two hours.

Richard Estreich, Weld County civil defense director, said today that damage estimates have not been made.

The hardest-hit area in Northern Colorado was Milliken, where 2 inches of rain fell in 20 minutes, Police Chief Guy Orazeman said.

The heavy rain caused the Hillsboro Ditch south of town to overflow, flooding five businesses and 10 homes in downtown. No injuries were reported.

Milliken Fire Chief Jerry Kilgore estimated that flooding caused at least \$5,800 damage.

The Johnstown, Milliken, and Kersey

fire departments evacuated residents from their homes and worked most of the night pumping water from basements and crawlspaces.

All residents returned to their homes by nightfall except one whose home received extensive flood damage.

Although the irrigation ditch contained no water before the storm, Kilgore said, the heavy rain and hail soon clogged the ditch, resulting in the overflow.

Milliken farmer Otto Ehrlich said the hail was "small and soft," so it did not damage his 2,200 acres of corn as much as expected.

But other farmers were not as fortunate. Kodak Colorado in Windsor, which leases about 1,600 of its adjacent lands for farming, reported extensive crop damage.

Kodak spokesman Chris Veronda said that 800 acres of Kodak's leased land was pounded by hail.

And Bill Sales, who farms the Kodak land, said that he lost about 100 acres of corn and sustained extreme damage to 200 acres of beets. Because of the damage late

in the season, he is unsure if he will be able to replant.

The rain and hail cut a swath through the area's farmlands, causing sporadic damage to farms in the Johnstown, Milliken, and Windsor areas.

Although some farmers fear damage will be costly, others said the storm did not cause extreme damage.

And most say that valuable topsoil was washed away by rain that was still standing in some fields today.

A few streets in Windsor reportedly flooded because the drainage system could not handle the heavy rains, Police Chief Chris Matson said.

Oak Street was closed for about two hours and portions of the sidewalk bordering the street were sandbagged to prevent flooding to two low-lying homes. One home sustained partial flooding, Matson said.

Power outages were also reported. Customers in the Milliken and Johnstown areas experienced a 50-minute power outage at 3:30, said Al Gubhardt of Public Service Co.

Intense rain, hail flood Milliken

By DAVE ALBEE

MILLIKEN—Residents of Milliken are cleaning up today after a flash flood Wednesday afternoon that caused at least \$5,000 damage to homes and businesses, according to initial reports.

Heavy rains and hail forced the Hillsboro Ditch to top its banks and overflow north down two side streets to Main Street. Five businesses and 10 homes reportedly flooded.

Milliken volunteer firemen evacuated several families around 4 p.m. No injuries were reported, however.

At least two funnel clouds were sighted in the vicinity when a thunderstorm system stalked the Front Range and western Weld County.

"I saw two of them," said Steve Mort, a volunteer fireman in Johnstown, located

four miles west of Milliken. "I didn't think anything of it. They just curled back up and went over head. I said 'OK, good. Let Windsor worry about it.'"

But no funnel clouds were sighted in Windsor, and Fort Lupton was the only Weld County town to report tornado damage.

One of the two funnel clouds Mort sighted was near Milliken. Initial reports had a tornado moving north from Battenville toward Milliken, where rain and hail were pummeling the area.

"The way it was storming," Milliken resident Wayne Olster said, "you couldn't have seen it."

Alan Brownwood, an area farmer, said the funnel cloud east of Milliken "looked like smoke."

Olster's wife Florence said that

hail—from pea-size to walnut-size—"just closed in from everywhere."

The storm, according to the Olsters, lasted about 20 minutes. Almost 2 inches of rain fell during that period.

Storm-related power outages caused some residents to lose power for about 50 minutes at 3:30 p.m.

One of the first houses to be flooded when the Hillsboro irrigation ditch overflowed was Jod Judson's on Irene Avenue.

Although Judson didn't believe the interior of his house incurred any flood damage, his lawn and garden were washed away. Still he, like many Milliken residents, found humor in the situation.

"Well, I can salvage my radishes," Judson said. "I can still see some floating over there."

The flash flood caught residents like Jim

Garduno by surprise. Garduno had just returned from work and was watching television when he received a telephone call from his sister.

Soon after Garduno noticed that water had engulfed his front lawn and had seeped into his car and a pick-up truck parked in the driveway.

"I decided I had better move these cars," he said. "I just wished I had some boots."

Water eventually spilled over Main Street into Martin's and Pat's trailer parks. Many residents there were temporarily forced from their homes.

Although the Hillsboro Ditch has overrun its banks before, rarely has it caused so much flooding, said Olster, a Milliken resident since 1941.

Weather

Rain causes flooding

By The Associated Press

Locally heavy rain caused flooding in the northern parts of Texas and Louisiana early today, while rain also fell from Arkansas to the Great Plains, and from the East Coast to the Ohio Valley.

Violent storms and up to a dozen tornadoes struck Colorado Wednesday, killing one person and injuring 42 others. The twisters struck several communities around Denver, damaging buildings, trees and power lines.

A tornado also touched down in Oklahoma City, injuring one person and damaging several buildings and power lines.

The National Weather Service forecast showers and thunderstorms today for the Plains, the lower Mississippi Valley, the Tennessee Valley, the upper Ohio Valley and the Atlantic Coast.

Temperatures around the nation at 3 a.m. EDT ranged from 42 in Butte, Mont., to 90 at Luke Air Force Base in Phoenix.

Loveland—Flash flood watch valid until 8:00 a.m. today. Local areas of patchy fog this morning. Otherwise variable cloudiness today with scattered showers and thunderstorms. Showers becoming isolated late tonight. Partly cloudy and warmer Friday. Highs today and Friday 70s to mid 80s. Lows tonight upper 40s to mid 50s. Precipitation probabilities 30 percent today.

Northern, Central, and Southern Mountains—Flash flood watch valid until 8am today for areas east of the Continental Divide. variable cloudiness today with scattered showers and thunderstorms. Showers ending tonight becoming partly cloudy and warmer Friday. Highs today and Friday mid 60s and 70s. Lows tonight mid 30s to mid 40s. Precipitation probabilities 30 percent today.

Western Slope and Four Corners—Clear to partly cloudy and warmer through Friday. With

isolated showers and thunderstorms today. Highs today and Friday mid 70s to mid 80s. Lows tonight 40s and mid 50s.

San Luis Valley—Variable cloudiness today with widely scattered showers and thunderstorms. Showers becoming isolated tonight. Partly cloudy and warmer Friday. Highs today and Friday low to mid 70s. Lows tonight mid 30s to low 40s. Precipitation probabilities 20 percent today.

State forecast

Flash flood watch valid until 8 a.m. today from the Continental Divide eastward to the Kansas border — not including the San Luis Valley. Variable cloudiness mountains and east today with scattered showers and thunderstorms. Showers becoming isolated by late tonight. Partly cloudy Friday. Clear to partly cloudy west through Friday with isolated showers and thunderstorms today. A little warmer west today and mountains and east Friday. Highs today and Friday mid-70s to

mid-80s lower elevations and 60s and 70s mountains. Lows tonight 40s and 50s with mid-30s and low 40s mountains.

State extended forecast Saturday through Monday

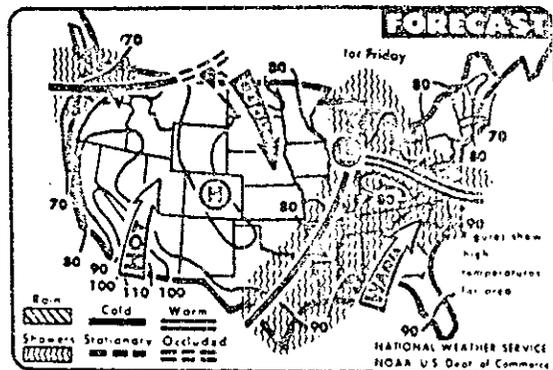
Mosly sunny Saturday, partly cloudy Sunday and Monday with scattered showers and thunderstorms mainly mountains and east. Continued warm days. Highs 70s and 80s lower elevations with 60s and 70s mountains. Lows 40s and 50s lower elevations with 30s and 40s mountains.

Area forecasts

New Mexico — Scattered thundershowers east today and tonight with locally heavy thunderstorms possible. Partly cloudy central and west with widely scattered afternoon thundershowers. A little cooler in the east. Mostly fair and warmer west Friday. Partly cloudy and slightly cooler east Friday with isolated showers or thundershowers. Highs mid-60s to 70s mountains warming to 70s and lower 80s Friday. At lower elevations highs ranging from the 70s in the northeast to the 90s southwest. Lows mid-30s to 40s mountains with mostly 50s elsewhere.

Western Kansas — Partly cloudy today and tonight. Highs today around 80. Lows tonight in the mid-50s. Sunny Friday. Highs in the low to mid-80s. Light and variable winds today and tonight.

Nebraska — Partly cloudy today with a chance for thundershowers mainly central. High mid-70s to around 80 west to the 80s southeast. Fair northwest and a chance for thundershowers southeast tonight. Lows upper 40s to the lower 50s northwest; to around 60 southeast. Partly cloudy with a slight chance for morning showers southeast Friday and mostly sunny central and west. Highs lower to mid-80s.



The National Weather Service forecast for Friday predicts showers over the eastern half of the nation stretching from Texas to the Great Lakes.

Reporter-Herald

102nd YEAR

LOVELAND, COLORADO 80537 (U.S.P.S. 321-020)

THURSDAY, JUNE 4, 1981

NO. 133

28 PAGES 25¢

Storm kept building strength

Tornado Warning—The National Weather Service has issued a tornado warning effective until 4 p.m. for western Weld County. A tornado was reported north of Platteville in southwest Weld County moving north at 10 miles per hour. This is a very dangerous tornado and has been on the ground for a long time. Persons at Windsor and Milliken should take action immediately. Persons in the city of Greeley should be prepared for immediate action.

It was 3:30 a.m. Wednesday when the National Weather Service in Denver issued its first severe thunderstorm watches for the Front Range.

The thunderstorm watches advanced to warnings, followed by tornado watches and warnings.

And by 2:21 that afternoon, the first in a series of tornadoes touched down at Sheridan Boulevard and West Alameda Avenue in Denver. And as the storms advanced north through Thornton and Northglenn, agencies were alerted and residents warned of the approaching danger.

Joel Rothfuss, of the National Weather Service, said that as the storm developed, the agency issued weather bulletins to the Division of Disaster Emergency Services and local law-enforcement agencies.

The first hint of real trouble came at 9:30 a.m., when the Weather Service issued a flood watch for Denver and Arapahoe counties.

By 12:40 p.m., "very heavy thunderstorms" were reported in northwest Boulder county, Rothfuss said.

The first tornado warning came at 1:20 p.m. for eastern Logan County, and only 23 minutes later, all of Eastern Colorado was alerted to the possibility of tornadoes.

At 2:10 p.m., a severe thunderstorm warning was issued for Jefferson County, western Arapahoe County, and all of Denver County.

At 2:21 p.m., the first of several tornadoes struck Denver and moved northward, causing massive destruction.

The tornadoes were part of a storm system that also carried rain and hail along the Front Range to Wyoming.

A weather forecaster said the storm was triggered by moist air from a thunderstorm in Denver Tuesday night, heated by subsequent warm temperatures.

Reporter-Herald

102nd YEAR

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THURSDAY, JUNE 4, 1981

NO. 133

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Tornado grinds through Thornton

By ANDREW ROSENTHAL

THORNTON (AP) — Gov. Richard Lamm today flew over the unroofed houses and debris-strewn streets of Thornton, where a powerful tornado cut a mile-long swath of destruction Wednesday, and said he was "awed by the capriciousness" of the twister.

"People on the ground when it hit had a lot of help from the Lord," he said while later touring parts of this Denver suburb in an automobile and on foot.

The tornado was one of a dozen or more tornadoes and funnel clouds spawned by a fast-moving storm system Wednesday afternoon that struck along a 35-mile arc in the Denver area. It injured 42 persons when it slashed through a commercial

district and residential area of Thornton. Seven of the injured remained hospitalized today, with one of them — an 18-year-old girl — listed in critical condition with multiple fractures.

Only one storm-related death was reported — a woman struck by lightning at a mountain lake west of Boulder, officials said.

Scattered reports of looting following the storm prompted state officials to call out the Colorado National Guard to patrol the area and allow only residents into the more heavily damaged areas. Thornton police Capt. Jack Baldwin said four persons were arrested during the night when they were caught trying to steal tires from a wrecked and abandoned home.

Parts of Denver, Lakewood and Northglenn also were damaged by the storm, but Thornton bore the brunt of the damage.

Lakewood officials estimated storm damage in that city at about \$200,000, state officials said.

But Thornton officials today estimated that the storm had caused at least \$3.5 million in damage to homes alone. A spokesman for the State Disaster Emergency Services agency said 40 to 30 homes were damaged or destroyed by the tornado in Thornton alone.

Accompanying Lamm on his helicopter visit to the stricken city of 40,000 was Brig. Gen. John France, Colorado's adjutant general and the man responsible for send-

ing the National Guard into the area.

Sue O'Brien, a Lamm spokeswoman, said that during a briefing by city officials Lamm discussed the possibility of Thornton receiving further outside financial assistance.

"It is unlikely that it (the damage) is of the magnitude to qualify for presidential disaster designation," she said, adding that the governor's office was examining other possible ways of aiding residents, such as making low-interest loans available.

The tornado touched down in southwest Denver and Thornton before skipping into nearby Northglenn and out onto farmland northeast of the city. Some houses were reduced to rubble in Thornton, and the

roofs of scores more were smashed into kindling by the twister.

The confusion that followed prompted Lamm to issue a "disaster emergency" proclamation and send military police from the 194th Colorado National Guard unit in Denver to the scene, said Sue O'Brien, his press secretary.

Mary McCarthy, 21, of Wharton, N.J., was killed after being hit by lightning near Brainard Lake in Boulder County and two other women with her were injured, officials said.

A spokeswoman for Valley View Hospital, Sonia Weiss, said Kim Franek, 18, of Thornton was in critical condition with multiple fractures from the tornado. Two others were reported in fair condition and four more people were in good condition.

The hospital treated 33 others for minor injuries, Ms. Weiss said. Two people were treated at St. Anthony Hospital and later released, a hospital spokeswoman, Betty Blackman, said.

Tornadoes are a rarity in the Denver area, and National Weather Service

forecasters said they could not recall a storm in Denver's past that matched the series of twisters and funnel clouds that hit the city Wednesday.

The twister first touched down at a busy southwest Denver intersection, scattering trees and broken glass and reducing the roof of an apartment complex there to a mass of twisted metal.

Miraculously, the only injuries reported were sustained in car accidents as the twister moved through.

The tornado then vanished into the clouds, bounced over downtown Denver and touched earth again at the D&B Shopping Center in Thornton. It tore the roof off the center and a nearby bank, blew the windows out of an apartment building and then headed northeast.

"It started way up in the air and then all kinds of clouds gathered and it came down fast," said Peter Baker, who was standing in his yard when the tornado hit. "We could see it moving straight at us across the roofs of the houses."

"Then we ran into the neighbor's house and huddled in a corner," Baker said. "When the roof starting coming off, I prayed to God for my life."

Baker's own house was cut in two by the twister. Across the street, a two-level camper was thrown 16 feet by the wind and flipped onto its roof. A light aluminum boat next to where the camper had been parked was unattached.

The destruction was spread in a patchwork-quilt across 100 blocks to the northeast. The twister touched down briefly northeast of the city before it dissipated after a fearful 90 minutes, but no extensive damage was reported.

In Thornton, streets that normally are tree-lined were littered with leaves and branches, some as thick as a man's thigh. Laraposts were snapped in half, their power lines trailing across backyards and draped over cars and fences.

Pieces of roof tiling, wood and bricks covered the streets. Cars lay on their roofs or were twisted beyond repair.

And everywhere the luckier residents pitched in to help others who were worse off.

"It's nice to know folks are still there when you need them," said Del Feenstra as two-dozen friends and neighbors helped clear his possessions from what was left of his home.

More stories, photos
Pages 3, 14

Reporter-Herald

Storm damage estimates rise

Estimates of Wednesday's storm-related flooding in Milliken remain at \$5,000, while damage caused by a tornado that tore through Fort Lupton have soared to \$500,000, officials said Thursday.

Sixteen houses and several businesses in Fort Lupton were damaged by a twister from a storm system that hit Northern Colorado Wednesday afternoon. Officials said

some structures were demolished. Roofs were ripped off others.

Most of the damage occurred in a residential section at 11th and Fulton streets and in an industrial area northeast of Fort Lupton. Only one minor injury was reported.

The tornado-laden storm caused millions of dollars in damage in suburban Denver. It moved north through western Weld County with funnel clouds and heavy

rain and hail.

Hail caused extensive damage to barley and wheat crops, said Arnold Germann, director of Weld County's Agricultural Stabilization and Conservation Service.

Germann said that damage estimates are difficult to make because farmers must wait one week after crops are damaged to apply for financial aid under the service's Disaster Assistance Program.

Germann said wheat and barley suffered the heaviest damage because their development was more advanced than corn crops.

Milliken Fire Chief Jerry Kilgore said he is sticking by his original estimate that flooding caused \$5,000 in damage to homes.

And Paul Thomas of Thomas Real Estate and Insurance Agency in Johnstown said the town had mostly minor damage. Flood victims live in a part of town that has previously experienced flash flooding, he said.

Thomas said that many Milliken residents did not carry flood insurance.

Farmers assess storm damage

By BECKY ORR

When you're a farmer, you quickly realize that job security depends on the uncontrollable whims of the weather.

A few minutes of heavy hail or rain at the wrong time can destroy months of work.

A prime example is Wednesday's storm, which dumped up to 2 inches of rain and several inches of hail on Weld County in an hour.

For most farmers, the storm merely prevented them from returning to their rain-soaked fields.

Others say the rain washed away valuable topsoil, which decreases the land's ability to absorb moisture.

Other crops were pelted by marble-sized hailstones. Farmers are assessing the damage.

Weld County Extension Agent Elmer Rothman said that farms near Johnstown and Windsor were hit the hardest by the storm.

"The area south of Kodak Colorado was really pounded by hail," he said.

One of the farmers whose crops were damaged is Merle Hojio of Windsor. Hojio,

'It's still a little early to tell the extent of the damage. Maybe it won't be as bad as we think.'

—A Windsor farmer

60, has farmed all his life, having learned the craft from his parents. He and his family moved to Windsor about 10 years ago.

Hojio and his son-in-law Bill Sayles grow sugar beets, corn, and pinto beans.

"It's still a little early to tell the extent of the damage," Hojio said, looking out over a newly planted bean field. "Maybe it won't be as bad as we think."

Sayles surveyed the fields Thursday and said he fears that the 80 to 100 acres of corn they planted is lost. Sayles estimated the loss at about \$100 an acre.

But he doesn't think the fields will be a total loss and said that they may replant the land in beans. "If you can plant it again the loss is minimal," he said.

But Sayles said that the hail did not cause the bulk of the damage. Instead, it

was the intense amount of rain in such a short period of time.

Sayles said that although he's seen larger hail, he doesn't know if he's ever witnessed such a heavy amount of rainfall in less than an hour's time.

But he still looks on the bright side. "If it had been a wind, it would have been worse."

Rick Hertzke of Windsor is also assessing the damage. Hertzke has about 200 acres of corn and a dairy farm about five miles west of Greeley on U.S. 34.

"It's hard to say what it did to the corn," he said. "But the hail pelted it down pretty good."

However, Hertzke is optimistic that the

corn can come back. The storm, he said, was "bad enough," but it did not wipe out his crop.

Ted Lind, who farms southwest of Windsor said that although the rain was heavy, bad damage was light.

Marvin Mellon, a farmer who lives three miles north of Johnstown, estimates that his area received 1.2 inches of rain. And, like Lind, he does not consider the damage heavy. "We were lucky," he said.

The heavy rains, he said, damaged some row crops by washing away the soil.

The same goes for Cliff Rutt. Rutt, who came home from his farming chores near Berthoud to find his wife seeking shelter in the cellar, says that water left a lake in one of his bottom fields.

Jacob Altergott still lives on his farm in Windsor. But he is retired and hires out most of the farming. Altergott's land barley escaped the wrath of the storm.

But although he was fortunate this time, Altergott has been rained out and hailed out more times than he'd like to remember during his 39-year farming career.

"You just grit your teeth," he said, "and go on."

FIGURE 1
DRAINAGE PROBLEM LOCATION MAP
EAST SIDE OF TOWN

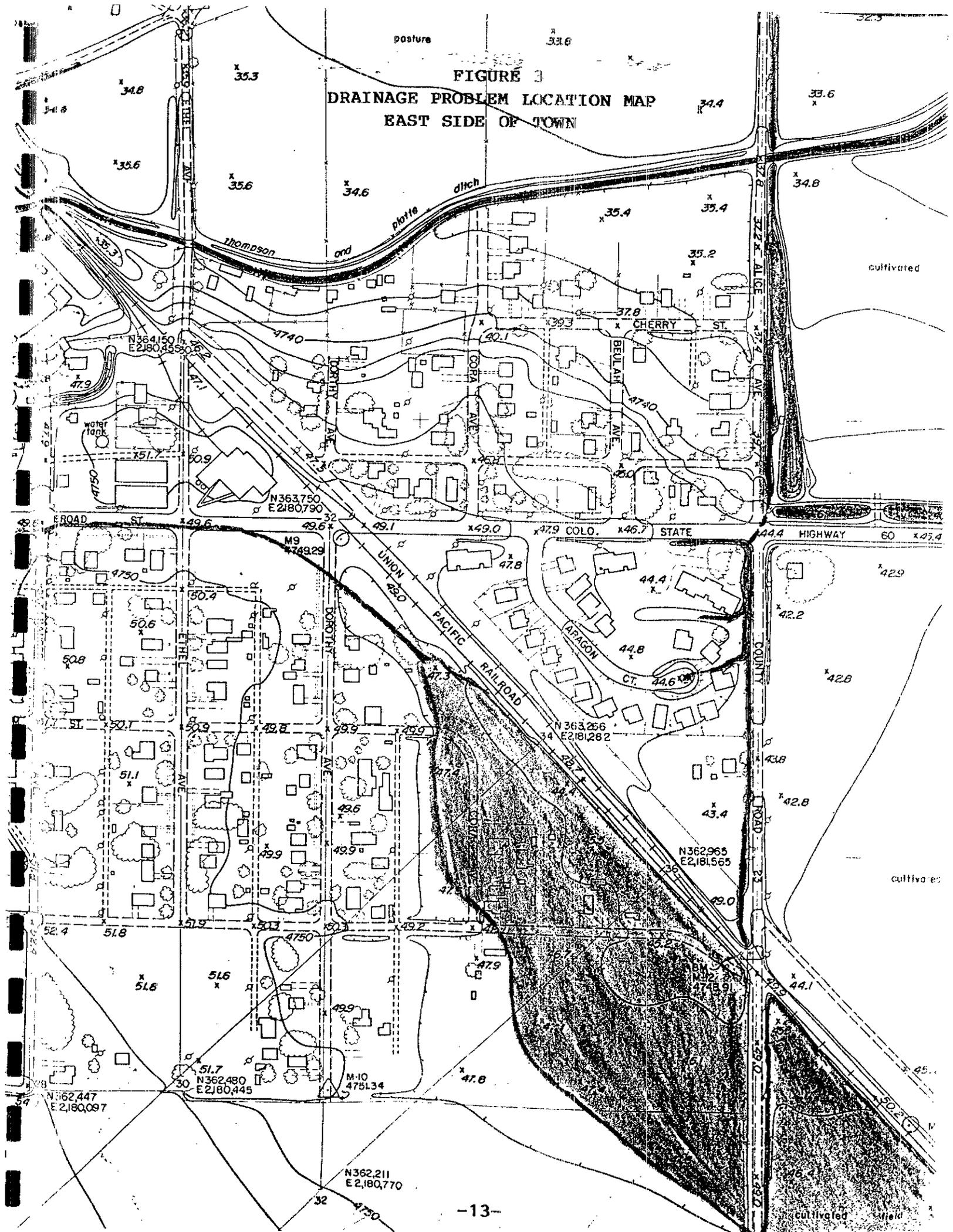


FIGURE 1
DRAINAGE PROBLEM LOCATION MAP
LOLA PARK

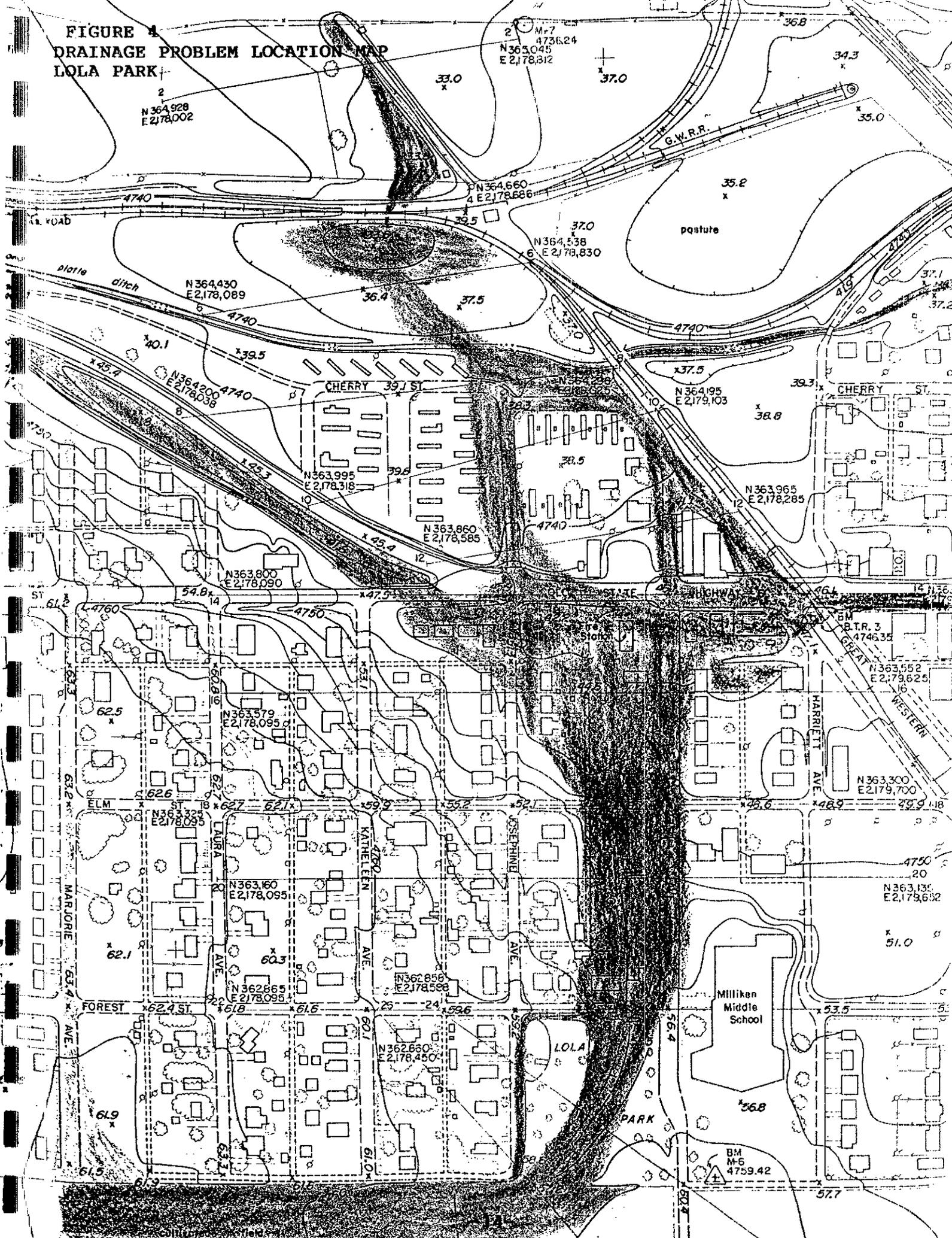




Photo-2 Looking upstream in Lola Park, June 3, 1981 Floods, Milliken, Colorado
Photos by Karen Schulenburg Loveland Daily Reporter-Herald



Photo-3 Looking upstream in Lola Park, June 3, 1981 Floods, Milliken, Colorado
Photos by Karen Schulenburg Loveland Daily Reporter-Herald

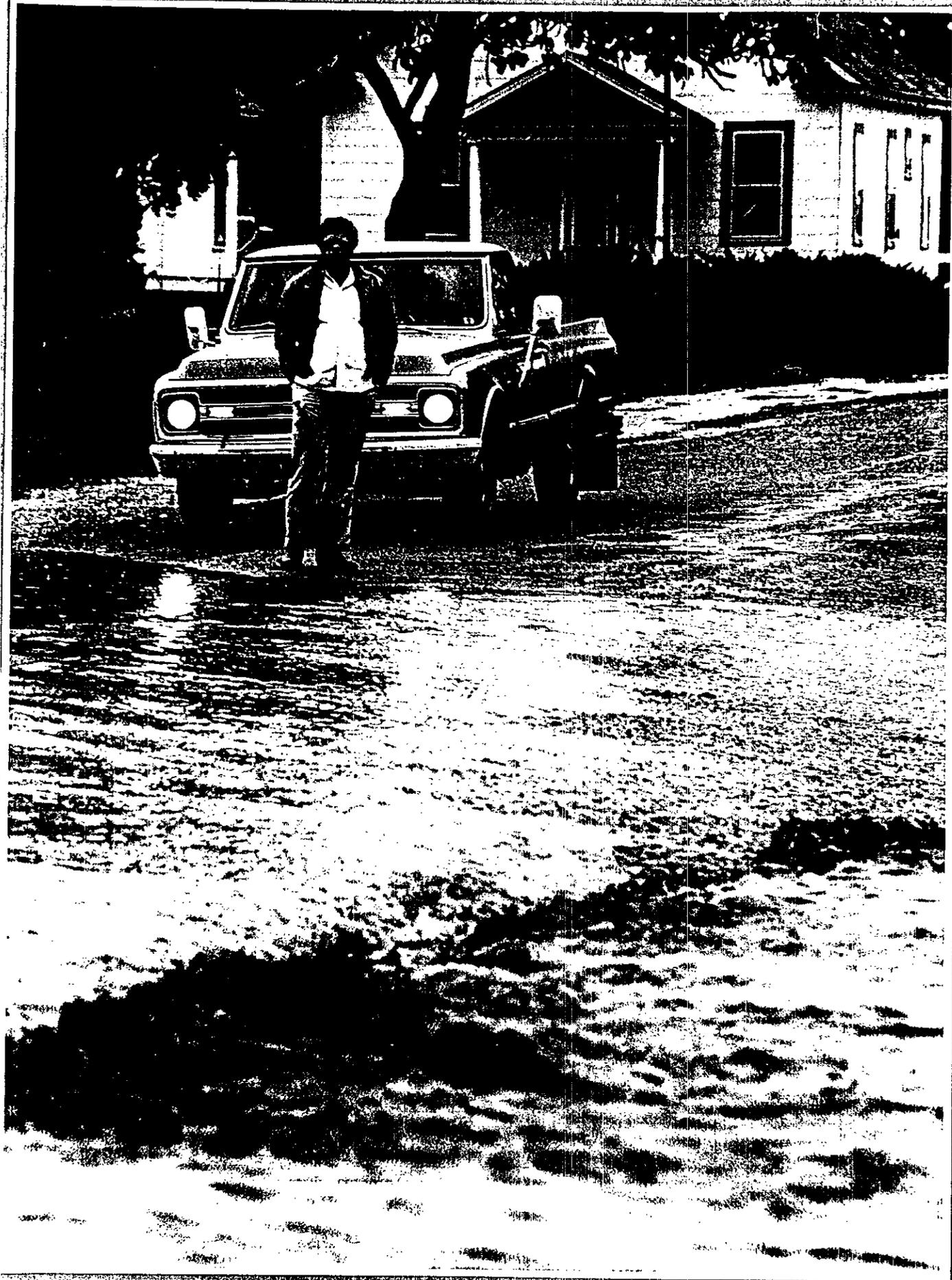


Photo-4 Looking West on Forest from Irene, June 3, 1981 Floods, Milliken, Colo.

Photos by Karen Schulenburg, Loveland Daily Reporter-Herald



Photo-6 NW Corner Irene & Forest, June 3, 1981 Floods, Milliken, Colorado
Photos by Karen Schulenburg, Loveland Daily Reporter-Herald

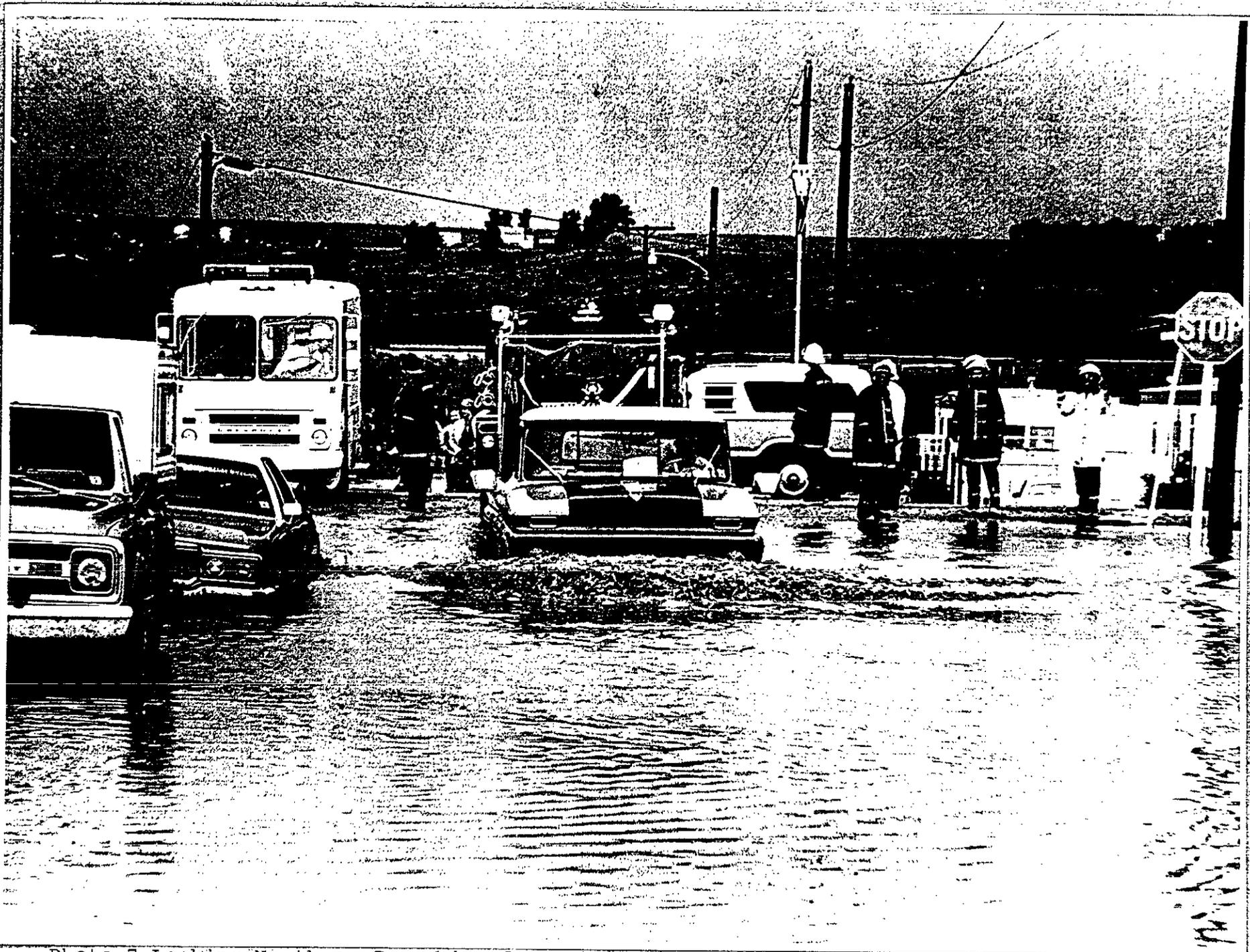


Photo-7. Looking North on Josephine from Elm, June 3, 1981 Floods, Milliken, Colorado

Photos by Karen Schulenburg, Loveland Daily Reporter-Herald



Photo-8. SW Corner Broad & Josephine, June 3, 1981 Floods, Milliken, Colorado

Photos by Karen Schulenburg, Loveland Daily Reporter Herald



Photo-9 SE Corner Broad & Katheleen, June 3, 1981 Floods, Milliken, Colorado

Photos by Karen Schulenburg, Loveland Daily Reporter-Herald



Photo-10-SH-60. Between Irene & Harriett, June 3, 1981 Floods, Milliken, Colorado

Photos by Karen, Schulenburg, Loveland Daily Reporter-Herald

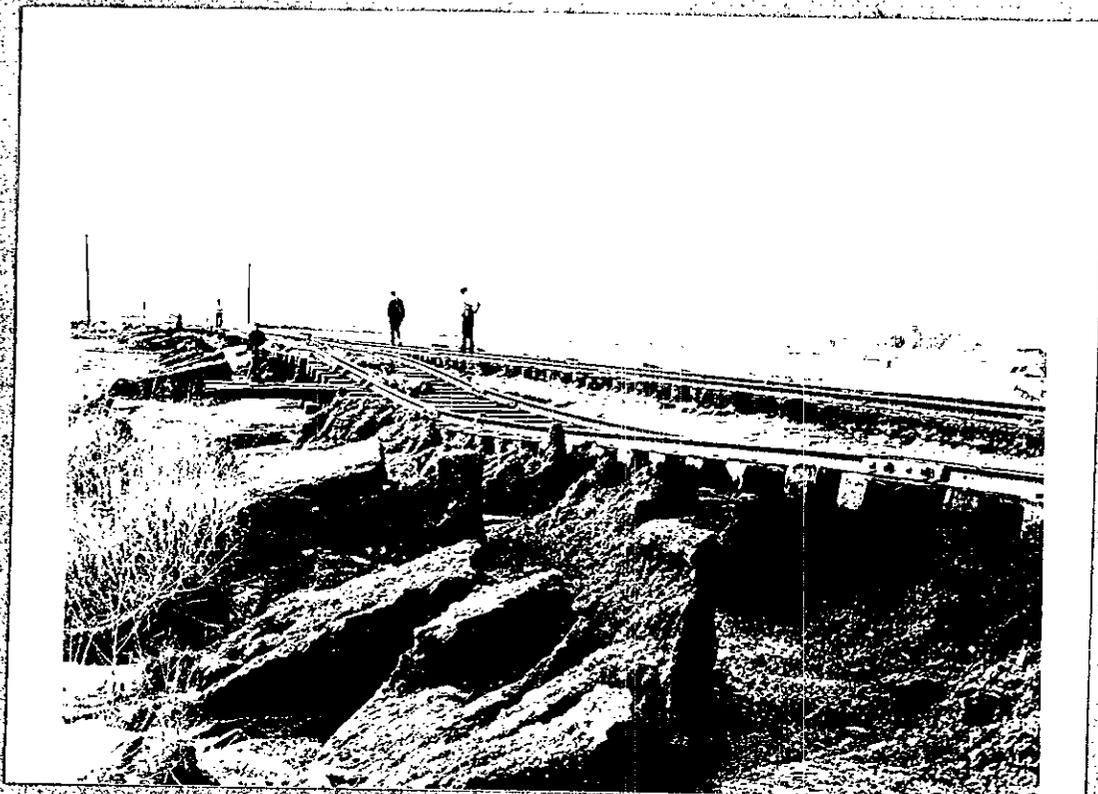


Photo 11
Looking southeast along Union Pacific Railroad Tracks
at Milliken, Colorado, June 25, 1982
Photo by Johnstown Breeze



Photo 12
Looking southeast along Union Pacific Railroad Tracks at
Milliken, Colorado, June 25, 1982
Photo by Johnstown Breeze



Photo 13
Looking southwest at water coming across Union Pacific
Railroad Tracks at Milliken, Colorado, June 25, 1982
Photo by Johnstown Breeze

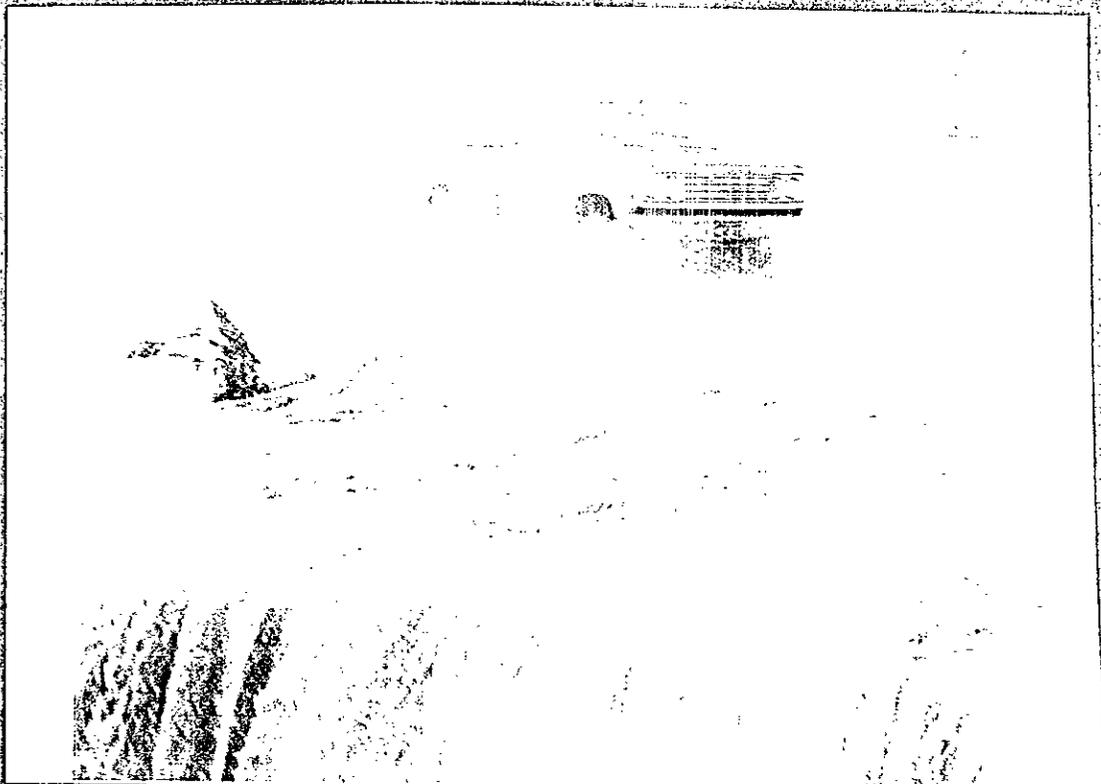


Photo 14
Water flowing over State Highway 60 just east
of Milliken, Colorado, June 25, 1982
Photo by Johnstown Breeze



Photo 15
Ponding along south Cora Avenue at Milliken, Colorado,
June 25, 1982
Photo by Johnstown Breeze

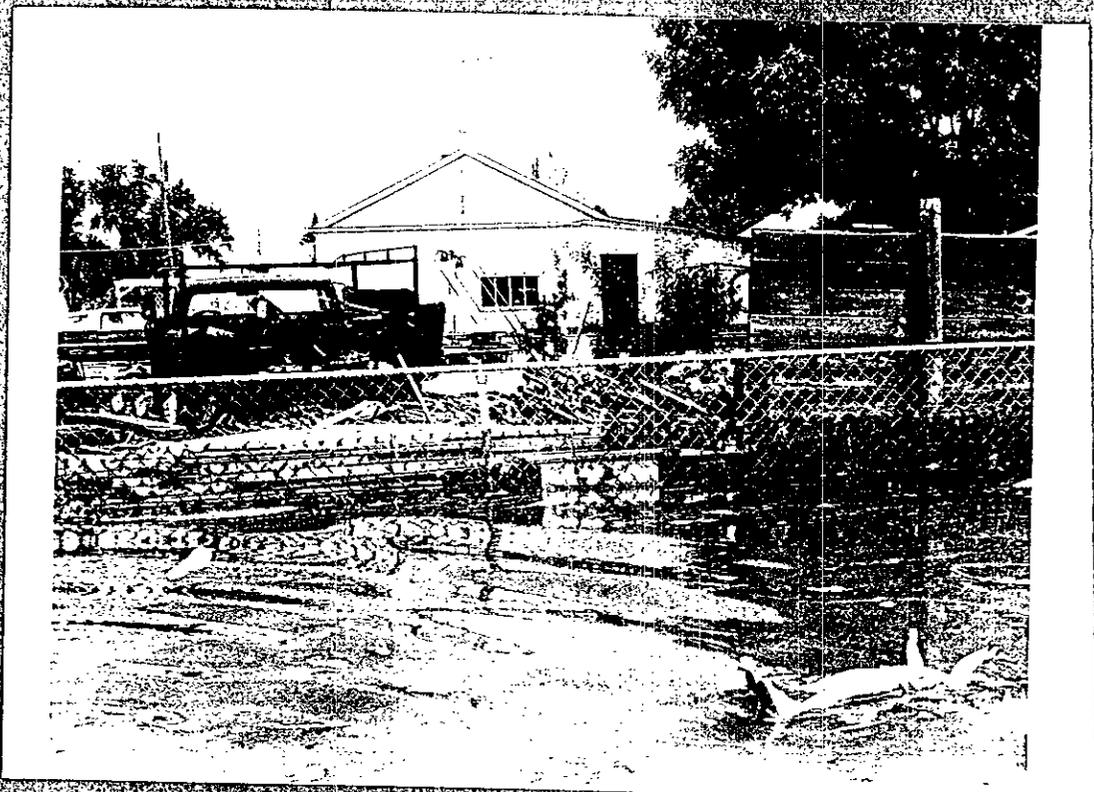


Photo 16
Ponding along South Cora Avenue at Milliken, Colorado
June 25, 1982
Photo by Johnstown Breeze

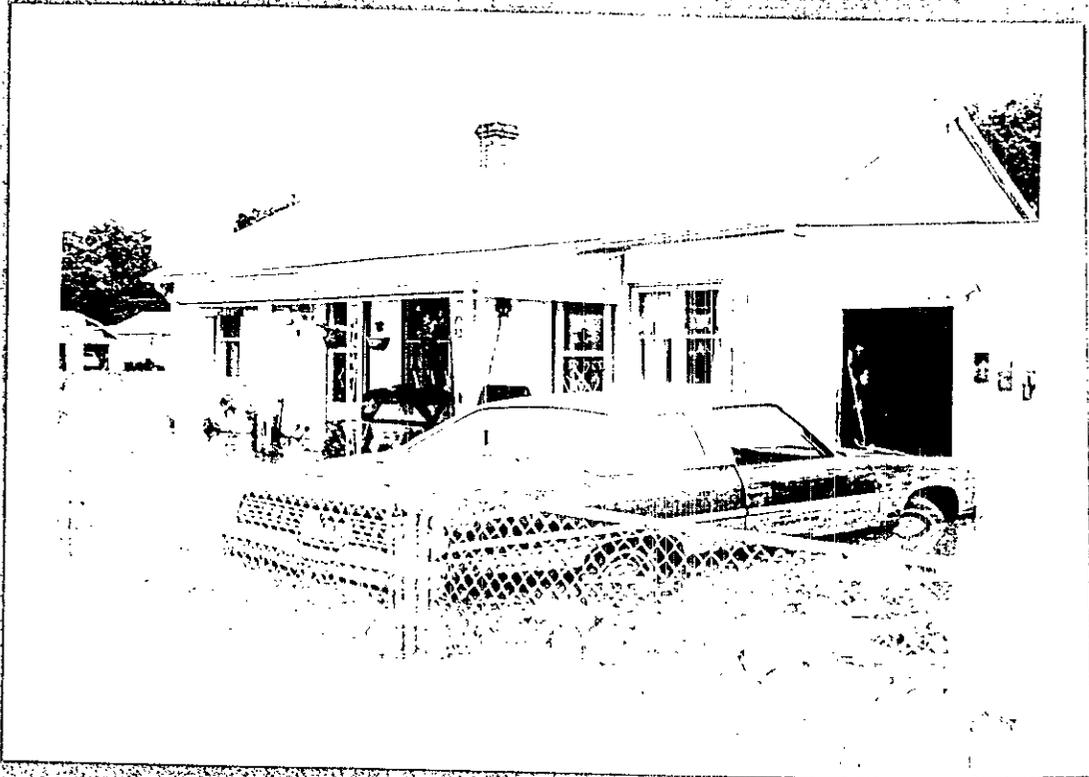


Photo 17
Ponding along South Cora Avenue at Milliken, Colorado,
June 25, 1982
Photo by Johnstown Breeze



Photo 18
Flooding June 25, 1982 at Milliken, Colorado
vicinity of Aragon Court
Photo by Johnstown Breeze



Photo 19
Flooding June 25, 1982 at Milliken, Colorado along
North Josephine Avenue
Photo by Johnstown Breeze