The minimum cost flow problem (MCFP) is a classical problem in combinatorial optimization and has many practical applications: telecommunication, traffic, material handling. Wallacher and Zimmermann proposed a primal interior point method for MCFP which finds a search direction by detecting a negative cycle. We presented a dual interior point method which finds a search direction by detecting a positive cut. This dual approach resulted in $O(n^2mL)$ algorithm for dense network, where $m$ denotes the number of arcs, $n$ denotes the number of nodes and $L$ denotes the total length of the input data.