

Nalco Holding CO

Form 424B3

March 31, 2006

Filed pursuant to Rule 424(b)(3)

A filing fee of \$412.33, calculated in accordance with

Rule 457(r), has been transmitted to the SEC in connection

with the offering of common stock pursuant to the registration statement

(File No. 333-130715) by means of this prospectus supplement.

PROSPECTUS SUPPLEMENT NO. 3

To prospectus dated December 27, 2005

223,328 Shares

Nalco Holding Company

Common Stock

The selling stockholders are offering up to 223,328 shares of our common stock owned by them or which they have the right to acquire upon the exercise of warrants or put rights. The selling stockholders may sell their shares of common stock from time to time in public transactions or in privately negotiated transactions at market prices prevailing at the time of sale or at negotiated prices. The timing and amount of any sale are within the sole discretion of the selling stockholders. The selling stockholders will receive all of the net proceeds from the sales of the common stock.

We have agreed to bear expenses in connection with the preparation and filing of the registration statement of which this prospectus forms a part. However, the selling stockholders will bear any fees or expenses related to any applicable underwriting discounts or commissions, brokers' fees and similar selling expenses, and any other fees and expenses incurred by the selling stockholders.

The selling stockholders and any broker-dealers that participate in the distribution of the common stock offered hereby may be deemed to be "underwriters" within the meaning of the Securities Act of 1933. As a result, any commission or profit on the resale of shares received by such broker-dealers may be deemed to be underwriting commissions and discounts under the Securities Act of 1933.

Our common stock is listed on the New York Stock Exchange under the symbol "NLC". The last reported sale price of our shares of common stock on the New York Stock Exchange on March 29, 2006 was \$17.60 per share.

See "Risk Factors" on page S-3 to read about factors you should consider before buying shares of the common stock.

Neither the Securities and Exchange Commission nor any other regulatory body has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

Prospectus Supplement dated March 29, 2006

You should rely only on information contained or incorporated by reference in this prospectus supplement and the accompanying prospectus. We have not authorized anyone to provide you with different information. We are not making an offer of these securities in any state where the offer is not permitted. You should not assume that the information contained or incorporated by reference in this prospectus supplement and the accompanying prospectus is accurate as of any date other than the date of the respective documents.

TABLE OF CONTENTS

Prospectus Supplement

	Page
Prospectus Summary	S-1
Risk Factors	S-3
Special Note Regarding Forward-Looking Statements	S-10
Use of Proceeds	S-10
Price Range of Common Stock	S-10
Selling Stockholders	S-11
Plan of Distribution	S-12
Validity of the Shares	S-13
Incorporation of Certain Documents by Reference	S-13

Prospectus

	Page
Prospectus Summary	1
Special Note Regarding Forward-Looking Statements	3
Use of Proceeds	3
Description of Capital Stock	4
Validity of the Shares	8
Experts	8
Available Information	8
Incorporation of Certain Documents by Reference	8

i

PROSPECTUS SUMMARY

This summary highlights selected information contained elsewhere in this prospectus supplement or the accompanying prospectus, but it may not contain all of the information that you should consider before deciding to invest in our common stock. You should read this entire prospectus supplement, including the “Risk Factors” section, the accompanying prospectus, the documents incorporated by reference and the other documents to which we refer for a more complete understanding of this offering.

All references in this prospectus to “we,” “our” and “us” refer collectively to Nalco Holding Company and its subsidiaries and affiliates on a consolidated basis.

Our Company

We are the leading global provider of integrated water treatment and process improvement services, chemicals and equipment programs for industrial and institutional applications. We are organized into three primary segments that correspond to the end markets we serve: Industrial and Institutional Services, Energy Services and Paper Services. Our products and services are typically used in water treatment applications to prevent corrosion, contamination and the buildup of harmful deposits, or in production processes to enhance process efficiency and improve our customers' end products.

Through our sales, research and marketing team of more than 7,000 technically trained professionals, we serve more than 70,000 customer locations. We focus on providing our customers with technologically advanced engineered solutions and services. These technologically advanced engineered solutions and services enable our customers to improve their business by increasing production yields, lowering manufacturing costs, extending asset lives and maintaining environmental standards. The cost of our technologically advanced engineered solutions and services represents a small share of our customers' overall production expense.

We derive our strength and stability from the quality of the products and services we provide and the diversity of our revenues. We serve a broad range of end markets, including aerospace, paper, chemical, pharmaceutical, petroleum, steel, power, food and beverage, medium and light manufacturing, mining, metalworking and institutions such as hospitals, universities and hotels. We believe we offer the broadest product portfolio in our industry, including more than 15,000 products and 8,000 unique formulations. We have also established a global presence, with nearly 10,900 employees operating in more than 130 countries, supported by a comprehensive network of manufacturing facilities, sales offices and research centers. This global presence provides a competitive advantage by enabling us to offer a consistently high level of service to our local, regional and multinational customers.

Industrial and Institutional Services

Our Industrial and Institutional Services division provides products and services that are principally utilized in water treatment applications, such as raw water treatment, wastewater treatment, cooling programs and boiler treatment programs to control corrosion, the build up of scale and microbial fouling. Customers use our water treatment programs to extend the useful life of their assets, minimize downtime of their facilities, conserve water and energy and decrease their total cost of operation. We serve companies across a broad spectrum of industries, including aerospace, chemical, pharmaceutical, steel, power, food and beverage, medium and light manufacturing, metalworking, mining, marine and institutions such as hospitals, universities and hotels.

Energy Services

Our Energy Services division provides on-site, technology driven solutions to the global natural gas, petroleum and petrochemical industries. In addition to recovery, production and process enhancements, we deliver a full range of water treatment offerings to refineries and petrochemical plants. Our upstream process applications improve oil and gas recovery and production, extend

S-1

production equipment life and decrease operating costs through services that include scale, paraffin and corrosion control, oil and water separation and gas hydrate management solutions. Our downstream process applications increase refinery and petrochemical plant efficiency and the useful lives of customer assets, while improving refined

and petrochemical product quality and yields.

Paper Services

Our Paper Services division offers a comprehensive portfolio of programs that are used in all principal steps of the paper-making process and across all grades of paper, including printing and writing, board and packaging, tissue and towel and mechanical papers. Our clients include the 20 largest paper companies in the world.

The Offering

Shares of common stock offered by the selling stockholders	223,328 shares
Shares of common stock outstanding before and after this offering	142,817,403 shares

Use of proceeds We will not receive any of the proceeds from the sale of shares of common stock by the selling stockholders. The selling stockholders will receive all proceeds from the sale of the shares of our common stock offered in this prospectus.

New York Stock Exchange symbol NLC
Unless we specifically state otherwise, all information in this prospectus:

- excludes 5,037,820 shares of common stock reserved for issuance pursuant to the warrant that we issued to Nalco LLC in November 2004; and
- excludes 7,423,740 shares of common stock reserved for issuance under the Nalco Holding Company 2004 Stock Incentive Plan..

Risk Factors

Investing in our common stock involves substantial risk. You should carefully consider all the information in or incorporated by reference in this prospectus supplement and accompanying prospectus prior to investing in our common stock. In particular, we urge you to consider carefully the factors set forth under the heading ‘‘Risk Factors.’’

Nalco Holding Company was incorporated in the State of Delaware in June 2004. Our principal executive offices are located at 1601 West Diehl Road, Naperville, Illinois 60563. Our main telephone number is (630) 305-1000. Our Internet address is www.nalco.com. Information contained on our website or that can be accessed through our website is not incorporated by reference in this prospectus supplement or the accompanying prospectus and you should not rely on that information.

S-2

RISK FACTORS

An investment in our common stock involves risks. You should carefully consider the risks described below, together with the other information in this prospectus supplement, the accompanying prospectus and incorporated herein by reference, before deciding to purchase any common stock.

Risks Related To Our Business

If we are unable to respond to the changing needs of a particular industry and to anticipate, respond to or utilize changing technologies and develop new offerings, it could become more difficult for us to respond to our customers' needs and cause us to be less competitive.

We have historically been able to maintain our market positions and margins through continuous innovation of products and development of new offerings to create value for our customers. Recent innovations and development that we have relied on include our 3D TRASAR system for controlling and monitoring chemical feed and our recent relationship with US Filter, which permits us to sell equipment solutions as part of a bundled offering to our water treatment customers. We may not be successful in continuing to make similar innovations in the future. Our future operating results will depend to a significant extent on our ability to continue to introduce new products and applications and to develop new offerings that offer distinct value for our customers. Many of our products may be affected by rapid technological change and new product introductions and enhancements. We expect to continue to enhance our existing products and identify, develop and manufacture new products with improved capabilities and make improvements in our productivity in order to maintain our competitive position. We intend to devote sizeable resources to the development of new technologically advanced products and systems and to continue to devote a substantial amount of expenditures to the research and development functions of our business. However, we cannot assure you that:

we will be successful in developing new products or systems or bringing them to market in a timely manner;

- products or technologies developed by others will not render our offerings obsolete or non-competitive;
- the market will accept our innovations;
- our competitors will not be able to produce our core non-patented products at a lower cost;
- we will have sufficient resources to research and develop all promising new technologies and products; or
- significant research and development efforts and expenditures for products will ultimately prove successful.

Our ability to anticipate, respond to and utilize changing technologies is crucial because we compete with many companies in each of the markets in which we operate. For example, we compete with hundreds of companies in the water treatment chemicals market, including our largest global competitor, GE Water Technologies. Other companies, including Ecolab, Inc., are expected to enter or increase their presence in our markets. Our ability to compete effectively is based on a number of considerations, such as product and service innovation, product and service quality, distribution capability and price. Moreover, water treatment for industrial customers depends on the particular needs of the industry. For example, the paper industry requires a specific water quality for bleaching paper; certain industrial boilers require demineralized water; the pharmaceuticals industry requires ultra pure water for processing; and, in the case of municipal services, water treatment includes clarification for re-use, sludge dewatering and membrane ultra filtration. We may not have sufficient financial resources to respond to the changing needs of a particular industry and to continue to make investments in our business, which could cause us to become less competitive.

S-3

Our substantial leverage could harm our business by limiting our available cash and our access to additional capital.

We are a highly leveraged company. As of December 31, 2005, our total consolidated indebtedness was \$3,266.8 million and we had \$250.0 million of borrowing capacity available under our revolving credit facility (excluding \$28.2 million of outstanding letters of credit).

Our high degree of leverage could have important consequences for you, including the following:

- It may limit our and our subsidiaries' ability to obtain additional financing for working capital, capital expenditures, product development, debt service requirements, acquisitions and general corporate or other purposes on favorable terms or at all;
- A substantial portion of our subsidiaries' cash flows from operations must be dedicated to the payment of principal and interest on their and our indebtedness and thus will not be available for other purposes, including operations, capital expenditures and future business opportunities;
- It may limit our ability to adjust to changing market conditions and place us at a competitive disadvantage compared to those of our competitors that are less highly-leveraged;
- It may restrict our ability to make strategic acquisitions or cause us to make non strategic divestitures; and
- We may be more vulnerable than a less leveraged company to a downturn in general economic conditions or in our business, or we may be unable to carry out capital spending that is important to our growth.

At December 31, 2005, we had \$1,278.6 million of variable rate debt. A 1% increase in the average interest rate would increase future interest expense by approximately \$12.8 million per year.

Despite our current leverage, we may still be able to incur substantially more debt. This could further exacerbate the risks that we and our subsidiaries face.

We and our subsidiaries may be able to incur substantial additional indebtedness in the future. The terms of the indentures governing our subsidiaries' notes do not fully prohibit us or our subsidiaries from doing so. Nalco Company's revolving credit facility provides commitments of up to \$250.0 million, all of which would have been available for future borrowings as of December 31, 2005 (excluding \$28.2 million of outstanding letters of credit). If new debt is added to our current debt levels, the related risks that we and our subsidiaries now face could intensify.

Our subsidiaries' debt agreements contain restrictions that limit our flexibility in operating our business.

Nalco Company's senior credit agreement and the indentures governing our subsidiaries' existing notes contain a number of significant covenants that, among other things, restrict our or our subsidiaries' ability to:

- incur additional indebtedness;
- pay dividends on or make other distributions or repurchase certain capital stock;
- make certain investments;
- enter into certain types of transactions with our affiliates;
- limit dividends or other payments by restricted subsidiaries;
- use assets as security in other transactions; and
- sell certain assets or merge with or into other companies.

In addition, under the senior credit agreement, Nalco Holdings LLC is required to satisfy and maintain specified financial ratios and tests. Events beyond our control may affect its ability to comply with those provisions and Nalco Holdings LLC may not be able to meet those ratios and tests. The

breach of any of these covenants would result in a default under the senior credit agreement and the lenders could elect to declare all amounts borrowed under the senior credit agreement, together with accrued interest, to be due and payable and could proceed against the collateral securing that indebtedness.

The terms of Nalco Company's senior credit agreement fully prohibit Nalco Holdings LLC and its subsidiaries from paying dividends or otherwise transferring their assets to us.

Our operations are conducted through our subsidiaries and our ability to make payments on any obligations we may have is dependent on the earnings and the distribution of funds from our subsidiaries. However, the terms of Nalco Company's senior credit agreement fully prohibit Nalco Holdings LLC and its subsidiaries from paying dividends or otherwise transferring their assets to us. Accordingly, under the terms of the credit agreement, Nalco Holdings LLC and its subsidiaries may not make dividends to Nalco Holding Company to enable it to pay dividends on our common stock.

Our significant non-U.S. operations expose us to global economic and political changes that could impact our profitability.

We have significant operations outside the United States, including joint ventures and other alliances. We conduct business in approximately 130 countries and in 2005, approximately 55% of our net sales originated outside the United States. There are inherent risks in our international operations, including:

- exchange controls and currency restrictions;
- currency fluctuations and devaluations, such as the recent currency crisis in Argentina;
- tariffs and trade barriers;
- export duties and quotas;
- changes in local economic conditions, such as the economic decline in Venezuela;
- changes in laws and regulations;
- difficulties in managing international operations and the burden of complying with foreign laws;
- exposure to possible expropriation or other government actions;
- restrictions on our ability to repatriate dividends from our subsidiaries; and
- unsettled political conditions and possible terrorist attacks against American interests.

Our international operations also expose us to different local political and business risks and challenges. For example, in certain countries we are faced with periodic political issues that could result in currency risks or the risk that we are required to include local ownership or management in our businesses. We are also periodically faced with the risk of economic uncertainty, such as recent strikes and currency exchange controls in Venezuela, which has impacted our business in these countries. Other risks in international business also include difficulties in staffing and managing local operations, including our obligations to design local solutions to manage credit risk to local customers and distributors.

Our overall success as a global business depends, in part, upon our ability to succeed in differing economic, social and political conditions. We may not continue to succeed in developing and implementing policies and strategies that are effective in each location where we do business, which could negatively affect our profitability.

Environmental, safety and production and product regulations or concerns could subject us to liability for fines or damages, require us to modify our operations and increase our manufacturing and delivery costs.

We are subject to the requirements of environmental and occupational safety and health laws and regulations in the United States and other countries. These include obligations to investigate and clean

S-5

up environmental contamination on or from properties or at off-site locations where we are identified as a responsible party. For example, we are currently identified as a potentially responsible party at certain waste management sites. Additionally, the U.S. Environmental Protection Agency is conducting a civil and criminal investigation of certain of our environmental practices at our Louisiana manufacturing facility. We have also been named as a defendant in a series of multi-party and individual lawsuits based on claims of exposure to hazardous materials. We cannot predict with certainty the outcome of any such tort claims or the involvement we might have in such matters in the future and there can be no assurance that the discovery of previously unknown conditions will not require significant expenditures. In each of these chemical exposure cases, our insurance carriers have accepted the claims on our behalf and our financial exposure is limited to the amount of our deductible; however, we cannot predict the number of claims that we may have to defend in the future and we may not be able to continue to maintain such insurance.

The U.K. Health and Safety Executive (“HSE”) has sent us notice that it intends to initiate legal proceedings against our U.K. subsidiary under the Health and Safety at Work Act. The place of these proceedings is not indicated in the notice. This notice references a legionella outbreak that is claimed to have originated at cooling towers owned by one of the subsidiary's customers. The HSE indicates that the proceedings will relate to the cleaning of these cooling towers. We have not received any specific charges or claims for relief, but will, in any event, defend and refute any contention that we violated any law.

We have made and will continue to make capital and other expenditures to comply with environmental requirements. Although we believe we are in material compliance with environmental law requirements, we may not have been and will not at all times be in complete compliance with all of these requirements, and may incur material costs, including fines or damages, or liabilities in connection with these requirements in excess of amounts we have reserved. In addition, these requirements are complex, change frequently and have tended to become more stringent over time. In the future, we may discover previously unknown contamination that could subject us to additional expense and liability. In addition, future requirements could be more onerous than current requirements.

The activities at our production facilities are subject to a variety of federal, state, local and foreign laws and regulations (“production regulations”). Similarly, the solid, air and liquid waste streams produced from our production facilities are subject to a variety of regulations (“waste regulations”) and many of our products and the handling of our products are governmentally regulated or registered (“product regulations”). Each of the production, waste and product regulations is subject to expansion or enhancement. Any new or tightened regulations could lead to increases in the direct and indirect costs we incur in manufacturing and delivering products to our customers. For example, the European Commission is currently considering imposing new chemical registration requirements on the manufacturers and users of all chemicals, not just those which are considered to be harmful or hazardous. Should such regulations, referred to as REACH, be imposed, all chemical companies will be faced with additional costs to conduct their businesses in European Commission countries. Similarly, certain of our products are used to assist in the generation of tax credits for our customers and the termination or expiration of such tax credits could impact the sale of these products. In addition to an increase in costs in manufacturing and delivering products, a change in production regulations or product regulations could result in interruptions to our business and potentially cause economic or consequential losses should we be unable to meet the demands of our customers for products.

We may not be able to achieve all of our expected cost savings.

A variety of risks could cause us not to achieve the benefits of our expected cost savings, including, among others, the following:

- higher than expected severance costs related to staff reductions;
- higher than expected retention costs for employees that will be retained;
- delays in the anticipated timing of activities related to our cost-saving plan, including the reduction of inefficiencies in our administrative and overhead functions; and

S-6

-
- other unexpected costs associated with operating the business.

We have experienced, and may continue to experience, difficulties in securing the supply of certain raw materials we and our competitors need to manufacture some of our products and increases in raw material costs.

In recent months, certain of the raw materials used by us and other chemical companies have faced supply limitation. If these limitations continue or become more severe, we risk shortfalls in our sales and the potential of claims from our customers if we are unable to fully meet contractual requirements.

Also, limitations on raw materials and rising prices for underlying products have resulted in price increases for raw materials we purchase, and we risk further price increases for these materials. Our margins have been impacted by such raw materials price increases and will continue to be impacted if we are unable to pass such increases through to our customers.

Our pension plans are currently underfunded and we may have to make significant cash payments to the plans, reducing the cash available for our business.

We sponsor various pension plans worldwide that are underfunded and require significant cash payments. For example, in 2004 and 2005, we contributed \$13.7 million and \$30.0 million, respectively, to our pension plans. We are required to contribute at least \$65.9 million to the U.S. pension plan in 2006. We may also opt to make additional voluntary contributions to various pension plans worldwide in 2006. If the performance of the assets in our pension plans does not meet our expectations, or if other actuarial assumptions are modified, our contributions for 2006 could be even higher than we expect. If our cash flow from operations is insufficient to fund our worldwide pension liability, we may be forced to reduce or delay capital expenditures, seek additional capital or seek to restructure or refinance our indebtedness.

As of December 31, 2005, our worldwide pension plans were underfunded by \$434.2 million (based on the actuarial assumptions used for purposes of Statement of Financial Accounting Standards (SFAS) No. 87, Employers' Accounting for Pensions). Our U.S. pension plans are subject to the Employee Retirement Income Security Act of 1974, or ERISA. Under ERISA, the Pension Benefit Guaranty Corporation, or PBGC, has the authority to terminate an underfunded pension plan under certain circumstances. In the event our U.S. pension plans are terminated for any reason while the plans are underfunded, we will incur a liability to the PBGC that may be equal to the entire amount of the underfunding.

We have recorded a significant amount of goodwill and other identifiable intangible assets, and we may never realize the full value of our intangible assets.

We have recorded a significant amount of goodwill and other identifiable intangible assets, including customer relationships, trademarks and developed technologies. Goodwill and other net identifiable intangible assets were

approximately \$3.4 billion as of December 31, 2005, or 62% of our total assets. Goodwill, which represents the excess of cost over the fair value of the net assets of the businesses acquired, was approximately \$2.2 billion as of December 31, 2005, or 40% of our total assets. Goodwill and net identifiable intangible assets are recorded at fair value on the date of acquisition and, in accordance with SFAS No. 142, Goodwill and Other Intangible Assets, will be reviewed at least annually for impairment. Impairment may result from, among other things, deterioration in our performance, adverse market conditions, adverse changes in applicable laws or regulations, including changes that restrict the activities of or affect the products and services sold by our business, and a variety of other factors. Some of the products and services we sell to our customers, including but not limited to those in the synthetic fuel industry, are dependent upon laws and regulations, and changes to such laws or regulations could impact the demand for our products and services. The amount of any quantified impairment must be expensed immediately as a charge to

results of operations. Depending on future circumstances, it is possible that we may never realize the full value of our intangible assets. Any future determination of impairment of a significant portion of goodwill or other identifiable intangible assets would have an adverse effect on our financial condition and results of operations.

S-7

Our future success will depend in part on our ability to protect our intellectual property rights, and our inability to enforce these rights could permit others to offer products competitive with ours, which could reduce our ability to maintain our market position and maintain our margins.

We rely on the patent, trademark, copyright and trade secret laws of the United States and other countries to protect our intellectual property rights. However, we may be unable to prevent third parties from using our intellectual property without authorization. The use of our intellectual property by others could reduce any competitive advantage we have developed or otherwise harm our business. If we had to litigate to protect these rights, any proceedings could be costly, and we may not prevail.

We have obtained and applied for several U.S. and foreign trademark registrations, and will continue to evaluate the registration of additional service marks and trademarks, as appropriate. Our pending applications may not be approved by the applicable governmental authorities and, even if the applications are approved, third parties may seek to oppose or otherwise challenge these registrations. A failure to obtain trademark registrations in the United States and in other countries could limit our ability to protect our trademarks and impede our marketing efforts in those jurisdictions.

Our Sponsors have significant influence on us and may have conflicts of interest with us or you in the future.

Immediately prior to the filing of this prospectus, Apollo Management L.P., The Blackstone Group and GS Capital Partners (collectively the "Sponsors") beneficially owned approximately 26.7% of our common stock. The number of nominees that Nalco LLC and the Sponsors are entitled to collectively designate for election to our board of directors is three. As a result, our Sponsors will continue to have significant influence over our decisions to enter into any corporate transaction and may be able to prevent any transaction that requires the approval of our board of directors or the equityholders, regardless of whether or not other members of our board of directors or equityholders believe that any such transactions are in their own best interests. For example, our Sponsors could influence a decision to sell revenue-generating assets, which could impair our long-term ability to declare dividends or grow our business. Additionally, our Sponsors are in the business of making investments in companies and may from time to time acquire and hold interests in businesses that compete directly or indirectly with us. Our Sponsors may also pursue acquisition opportunities that may be complementary to our business, and as a result, those acquisition opportunities may not be available to us.

Risks Related To This Offering

Future sales of our shares could depress the market price of our common stock.

The market price of our common stock could decline as a result of sales of a large number of shares of common stock in the market after the offering or the perception that such sales could occur. These sales, or the possibility that these sales may occur, also might make it more difficult for us to sell equity securities in the future at a time and at a price that we deem appropriate.

Immediately prior to the filing of this prospectus, we had 142,817,403 shares of common stock outstanding, of which 100,755,818 shares were freely tradable. The 223,328 shares that will be sold in this offering will also be freely tradable. After the consummation of this offering, and subject to the volume, manner of sale and other conditions of Rule 144 under the Securities Act, 41,838,257 shares of our common stock will

S-8

be available for sale in the public market under exemptions from registration requirements. The Sponsors and their affiliates, which collectively beneficially owned 38,124,191 of our shares immediately prior to the filing of this prospectus, have the ability to cause us to register the resale of their beneficially owned shares.

In addition, subject to certain conditions, certain members of our management who hold units of Nalco LLC will be able to sell back or “put” to Nalco LLC their class A units, along with those of their class B units, class C units and class D units that have vested, in exchange for our shares of common stock owned by Nalco LLC. In November 2004, we provided a warrant to Nalco LLC that entitles it to acquire up to 6,191,854 shares of our common stock for \$0.01 per share, which will allow Nalco LLC to deliver our shares in satisfaction of such “put” rights. 1,154,034 of the shares have been delivered to Nalco LLC pursuant to the warrant. As a result, an additional 5,037,820 shares of our common stock may still be delivered pursuant to the warrant in the future.

The market price of our common stock may be volatile, which could cause the value of your investment to decline.

Securities markets worldwide experience significant price and volume fluctuations. This market volatility, as well as general economic, market or potential conditions, could reduce the market price of our common stock in spite of our operating performance. In addition, our operating results could be below the expectations of securities analysts and investors, and in response, the market price of our common stock could decrease significantly.

Provisions in our amended and restated certificate of incorporation and bylaws and Delaware law may discourage a takeover attempt.

Provisions contained in our amended and restated certificate of incorporation and bylaws and Delaware law could make it more difficult for a third party to acquire us, even if doing so might be beneficial to our stockholders. Provisions of our amended and restated certificate of incorporation and bylaws impose various procedural and other requirements, which could make it more difficult for stockholders to effect certain corporate actions. For example, our amended and restated certificate of incorporation authorizes our board of directors to determine the rights, preferences, privileges and restrictions of unissued series of preferred stock, without any vote or action by our stockholders. Thus, our board of directors can authorize and issue shares of preferred stock with voting or conversion rights that could adversely affect the voting or other rights of holders of our common stock. These rights may have the effect of delaying or deterring a change of control of our company. In addition, a change of control of our company

may be delayed or deterred as a result of our having three classes of directors. Additionally, Section 203 of the Delaware General Corporation Law provides that, subject to specified exceptions, a Delaware corporation shall not engage in business combinations with any entity that acquires enough shares of our common stock without the consent of our board of directors to be considered an “interested stockholder” under Delaware law for a three-year period following the time that the stockholder became an interested stockholder. These provisions could limit the price that certain investors might be willing to pay in the future for shares of our common stock.

S-9

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein include “forward-looking statements.” These forward-looking statements include statements concerning our plans, objectives, goals, strategies, future events, future revenue or performance, capital expenditures, financing needs, plans or intentions relating to acquisitions, business trends and other information that is not historical information. When used in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein, the words “estimates,” “expects,” “anticipates,” “projects,” “plans,” “intends,” “believes,” “forecasts,” or future verbs, such as “will,” “should,” “could” or “may,” and variations of such words or similar expressions are intended to identify forward-looking statements. All forward-looking statements, including, without limitation, management’s examination of historical operating trends and data, are based upon our current expectations and various assumptions. Our expectations, beliefs and projections are expressed in good faith and we believe there is a reasonable basis for them. However, there can be no assurance that management’s expectations, beliefs and projections will be achieved.

There are a number of risks and uncertainties that could cause our actual results to differ materially from the forward-looking statements contained in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein. Important factors that could cause our actual results to differ materially from the forward-looking statements we make in this prospectus supplement, accompanying prospectus or in documents incorporated by reference herein are set forth in this prospectus supplement, including under the heading “Risk Factors.”

All forward-looking statements attributable to us or persons acting on our behalf apply only as of the date they were made and are expressly qualified in their entirety by the cautionary statements included in this prospectus supplement and the accompanying prospectus. We undertake no obligation to update or revise forward-looking statements which may be made to reflect events or circumstances that arise after the date made or to reflect the occurrence of unanticipated events.

USE OF PROCEEDS

We will not receive any of the proceeds from the sale of shares of our common stock by the selling stockholders. The selling stockholders will receive all net proceeds from the sale of the shares of our common stock in this offering.

PRICE RANGE OF COMMON STOCK

Our common stock has traded on the New York Stock Exchange under the symbol “NLC” since November 11, 2004. The following table sets forth the high and low intraday sales prices per share of our common stock, as reported by the New York Stock Exchange, for the periods indicated.

	Price Range	
	High	Low
2004		
Quarter ended December 31, 2004 (from November 11, 2004)	\$ 20.24	\$ 15.00
2005		
Quarter ended March 31, 2005	\$ 20.94	\$ 18.10
Quarter ended June 30, 2005	\$ 19.87	\$ 16.84
Quarter ended September 30, 2005	\$ 22.03	\$ 15.49
Quarter ended December 31, 2005	\$ 18.40	\$ 14.25
2006		
Quarter ended March 31, 2006 (through March 29, 2006)	\$ 18.88	\$ 16.69

The closing sale price of our common stock, as reported by the New York Stock Exchange, on March 29, 2006 was \$17.60. As of January 9, 2006, there were 5,789 holders of record of our common stock.

S-10

SELLING STOCKHOLDERS

We are registering shares that were privately issued to management members who exchanged their Nalco LLC class A units, as well as their vested Nalco LLC class B, C and D units (pursuant to management members agreements), for our shares.

The following table sets forth information, as of March 29, 2006, with respect to the selling stockholders and the number of shares of common stock beneficially owned by each selling stockholder that may be offered under this prospectus. The information is based on information provided by or on behalf of the selling stockholders. Unless otherwise indicated, the address of each person named below is c/o Nalco Holding Company, 1601 West Diehl Road, Naperville, Illinois, 60563.

The selling stockholders may offer all, some or none of the common stock. Because the selling stockholders may offer all or some portion of the common stock, no estimate can be given as to the amount of the common stock that will be held by the selling stockholders upon termination of any sales.

Selling stockholders, including their transferees, pledgees or donees or their successors, may from time to time offer and sell pursuant to this prospectus any or all of the common stock. Identification of any additional selling stockholders, if any, will be made in the applicable prospectus supplement. Information about the selling stockholders may change over time. Any changed information will be set forth in prospectus supplements or post-effective amendments. From time to time, additional information concerning ownership of the stock may rest with holders of the common stock not named in the table below and of whom we are unaware.

Name of Selling Stockholder	Shares Beneficially Owned Prior to this Offering		Shares Being Offered	Shares Beneficially Owned After this Offering ⁽²⁾	
	Number	Percent ⁽¹⁾		Number	Percent ⁽¹⁾

Other selling stockholders
representing less than 1%
owners of our common
stock as a group

234,590	*	223,328	11,262	*
---------	---	---------	--------	---

*Less than one percent.

(1)The percentage of common stock beneficially owned is based on 142,817,403 shares outstanding as of March 29, 2006.

(2)Assumes all shares being offered by this prospectus are sold.

S-11

PLAN OF DISTRIBUTION

The selling stockholders and their successors, including their transferees, pledgees or donees or their successors, may sell the common stock directly to purchasers or through underwriters, broker-dealers or agents, who may receive compensation in the form of discounts, concessions or commissions from the selling stockholders or the purchasers. These discounts, concessions or commissions as to any particular underwriter, broker-dealer or agent may be in excess of those customary in the types of transactions involved. The common stock may be sold in one or more transactions at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market prices, at varying prices determined at the time of sale, or at negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions:

- on any national securities exchange or U.S. inter-dealer system of a registered national securities association on which the common stock may be listed or quoted at the time of sale;
- in the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- through the writing of options, whether the options are listed on an options exchange or otherwise; or
- through the settlement of short sales.

In connection with the sale of the common stock, the selling stockholders may enter into hedging transactions with the broker-dealers or other financial institutions, which may in turn engage in short sales of the common stock in the course of hedging the positions they assume. The selling stockholders may also sell the common stock short and deliver these securities to close out their short positions, or loans or pledge the common stock to broker-dealers that in turn may sell these securities.

The selling stockholders will act independently of us in making decisions with respect to the timing, manner and size of each sale. The aggregate proceeds to the selling stockholders from the sale of the common stock offered by them will be the purchase price of the common stock less discounts and commissions, if any. Each of the selling stockholders reserves the right to accept and, together with their agents from time to time, to reject, in whole or in part, any proposed purchase of common stock to be made directly or through agents. We will not receive any of the proceeds from the sale by the selling stockholders of the common stock.

Our outstanding common stock is listed for trading on the New York Stock Exchange. In order to comply with the securities laws of some states, if applicable, the common stock may be sold in these jurisdictions only through registered or licensed brokers or dealers. In addition, in some states the common stock may not be sold unless they have been registered or qualified for sale or an exemption from registration or qualification requirements is available and is complied with.

The selling stockholders and any underwriters, broker-dealers or agents that participate in the sale of the common stock may be deemed to be “underwriters” within the meaning of Section 2(11) of the Securities Act. As a result, any profits on the sale of the common stock by selling stockholders who are, or are deemed to be, underwriters and any discounts, commissions or concessions received by any such broker-dealers or agents who are, or are deemed to be, underwriters may be deemed to be underwriting discounts or commissions under the Securities Act. Selling stockholders who are deemed to be “underwriters” within the meaning of Section 2(11) of the Securities Act will be subject to the prospectus delivery requirements of the Securities Act. The selling stockholders have acknowledged that they understand their obligations to comply with the provisions of the Exchange Act and the rules thereunder relating to stock manipulation, particularly Regulation M.

In addition, any securities covered by this prospectus that qualify for sale pursuant to Rule 144 or Rule 144A of the Securities Act may be sold under Rule 144 or Rule 144A rather than pursuant to this prospectus. A selling stockholder may not sell, transfer, devise or gift these securities by other means not described in this prospectus.

S-12

VALIDITY OF THE SHARES

The validity of the issuance of the shares of common stock to be sold in this offering will be passed upon for us by Simpson Thacher & Bartlett LLP, New York, New York. An investment vehicle comprised of selected partners of Simpson Thacher & Bartlett LLP, members of their families, related parties and others owns an interest representing less than 1% of the capital commitments of funds controlled by one of our large shareholders, The Blackstone Group.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to “incorporate by reference” the information contained in documents that we file with them, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus supplement and the accompanying prospectus. Information in this prospectus supplement and the accompanying prospectus supersedes information incorporated by reference that we filed with the SEC prior to the date of the accompanying prospectus, while information that we file later with the SEC will automatically update and supersede this information. We incorporate by reference the documents listed below and any future filings we will make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934.

- Our Annual Report on Form 10-K for the fiscal year ended December 31, 2005;
- Our Current Reports on Form 8-K filed on January 27, 2006, February 15, 2006, February 21, 2006 and March 20, 2006; and
- All documents filed by us under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934 on or after the date of the accompanying prospectus and before the termination of this offering.

You can request a copy of these filings at no cost, by writing or calling us at the following address:

Nalco Holding Company
1601 West Diehl Road
Naperville, IL 60563
(630) 305-1000

Attention: Corporate Secretary

S-13

PROSPECTUS

Nalco Holding Company

Common Stock

We and/or selling stockholders to be named in a prospectus supplement may offer and sell shares of our common stock from time to time in amounts, at prices and on terms that will be determined at the time of the offering. Each time common stock is offered, we will provide a prospectus supplement and attach it to this prospectus. The prospectus supplement will contain more specific information about the offering. The supplements may also add, update or change information contained in this prospectus. This prospectus may not be used to offer or sell securities without a prospectus supplement describing the method and terms of the offering.

You should carefully read this prospectus and any accompanying prospectus supplement, together with the documents we incorporate by reference, before you invest in our common stock.

Investing in our common stock involves risks. You should consider the risk factors described in any accompanying prospectus supplement or any of the documents we incorporate by reference.

Our common stock is listed on the New York Stock Exchange under the symbol "NLC."

Neither the Securities and Exchange Commission nor any other regulatory body has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

Prospectus dated December 27, 2005

You should rely only on information contained or incorporated by reference in this prospectus and any prospectus supplement. We have not authorized anyone to provide you with different information. We are not making an offer of these securities in any state where the offer is not permitted. You should not assume that the information contained or incorporated by reference in this prospectus or any prospectus supplement is accurate as of any date other than the date of the document containing the information.

TABLE OF CONTENTS

	Page
Prospectus Summary	1
Special Note Regarding Forward-Looking Statements	3
Use of Proceeds	3
Description of Capital Stock	4
Validity of the Shares	8
Experts	8
Available Information	8
Incorporation of Certain Documents by Reference	8

i

PROSPECTUS SUMMARY

This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission using a "shelf" registration process. Under this shelf registration process, we and/or selling stockholders to be named in a prospectus supplement may, over time, offer and sell our common stock in one or more offerings. Each time common stock is offered, we will provide a prospectus supplement and attach it to this prospectus. The prospectus supplement will contain specific information about the terms of the offering at that time. A prospectus supplement may also add, update or change information contained in this prospectus. Any statement that we make in this prospectus will be modified or superseded by any inconsistent statement made by us in a prospectus supplement. You should read both this prospectus and any accompanying prospectus supplement together with the additional information described under the heading "Incorporation of Certain Documents by Reference."

All references in this prospectus to "we," "our" and "us" refer collectively to Nalco Holding Company and its subsidiaries and affiliates on a consolidated basis.

Our Company

We are the leading global provider of integrated water treatment and process improvement services, chemicals and equipment programs for industrial and institutional applications. We are organized into three primary divisions which correspond to the end markets we serve: Industrial and Institutional Services, Energy Services and Paper Services. Our products and services are typically used in water treatment applications to prevent corrosion, contamination and the buildup of harmful deposits, or in production processes to enhance process efficiency and improve our customers' end products.

Through our sales, research and marketing team of more than 6,500 technically trained professionals, we serve more than 60,000 customer locations. We focus on providing our customers with technologically advanced engineered solutions and services. These technologically advanced engineered solutions and services enable our customers to improve their business by increasing production yields, lowering manufacturing costs, extending asset lives and maintaining environmental standards. The cost of our technologically advanced engineering solutions and services represents a small share of our customers' overall production expense. We offer more than 5,000 products and 3,100 unique formulations.

Industrial and Institutional Services

Our Industrial and Institutional Services division provides products and services that are principally utilized in water treatment applications such as raw water treatment, wastewater treatment, cooling programs and boiler treatment programs to control corrosion, the build up of scale and microbial fouling. Customers use our water treatment programs to extend the useful life of their assets, minimize downtime of their facilities and conserve water and energy. We serve companies across a broad spectrum of industries, including aerospace, chemical, pharmaceutical, steel, power, food and beverage, medium and light manufacturing, metalworking and institutions such as hospitals, universities and hotels.

Energy Services

Our Energy Services division provides on-site, technology driven solutions to the global natural gas, petroleum and petrochemical industries. In addition to recovery, production and process enhancements, we deliver a full range of water treatment offerings to refineries and petrochemical plants. Our upstream process applications improve oil and gas recovery and production, extend production equipment life and decrease operating costs through services that include scale, paraffin and corrosion control, oil and water separation and gas hydrate management solutions. Our downstream process applications increase refinery and petrochemical plant efficiency and the useful lives of customer assets, while improving refined and petrochemical product quality and yields.

1

Paper Services

Our Paper Services division offers a comprehensive portfolio of programs that are used in all principal steps of the paper-making process and across all grades of paper, including printing and writing, board and packaging, tissue and towel and mechanical papers. Our customers include the 20 largest paper companies in the world.

Risk Factors

Investing in our common stock involves substantial risk. You should carefully consider all the information in or incorporated by reference in this prospectus and any accompanying prospectus supplement prior to investing in our common stock. In particular, we urge you to consider carefully the factors set forth under the heading "Risk Factors."

Nalco Holding Company was incorporated in the State of Delaware in June 2004. Our principal executive offices are located at 1601 West Diehl Road, Naperville, Illinois 60563. Our main telephone number is (630) 305-1000. Our Internet address is www.nalco.com. Information contained on our website or that can be accessed through our website is not incorporated by reference in this prospectus and you should not rely on that information.

2

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, any prospectus supplement and the documents incorporated by reference herein include "forward-looking statements." These forward-looking statements include statements concerning our plans, objectives, goals, strategies, future events, future revenue or performance, capital expenditures, financing needs, plans or intentions relating to acquisitions, business trends and other information that is not historical information. When used in this prospectus and the documents incorporated by reference herein, the words "estimates," "expects," "anticipates," "projects," "plans," "intends," "believes," "forecasts," or future or conditional verbs, such as "will," "should," "could" or "may," and variations of such words or similar expressions are intended to identify forward-looking statements. All forward-looking statements, including, without limitation, management's examination of historical operating trends and data, are based upon our current expectations and various assumptions. Our expectations, beliefs and projections are expressed in good faith and we believe there is a reasonable basis for them. However, there can be no assurance that management's expectations, beliefs and projections will be achieved.

There are a number of risks and uncertainties that could cause our actual results to differ materially from the forward-looking statements contained in this prospectus, any prospectus supplement and the documents incorporated by reference herein. Important factors that could cause our actual results to differ materially from the forward-looking statements we make in this prospectus or any prospectus supplement are set forth or incorporated by reference in this prospectus.

All forward-looking statements attributable to us or persons acting on our behalf apply only as of the date such statements are made and are expressly qualified in their entirety by the cautionary statements included in this prospectus. We undertake no obligation to update or revise forward-looking statements which may be made to reflect events or circumstances that arise after the date made or to reflect the occurrence of unanticipated events.

USE OF PROCEEDS

We intend to use the net proceeds from the sales of our common stock as set forth in the applicable prospectus supplement. We will not receive any proceeds from the sale of any shares of common stock offered by selling stockholders.

3

DESCRIPTION OF CAPITAL STOCK

The following is a description of the material terms of our amended and restated certificate of incorporation and bylaws. We refer you to our amended and restated certificate of incorporation and bylaws, copies of which are incorporated by reference into this registration statement of which this prospectus forms a part.

Authorized Capitalization

As of December 1, 2005, our authorized capital stock consisted of (i) 500,000,000 shares of common stock, par value \$0.01 per share, and (ii) 100,000,000 shares of preferred stock, par value \$0.01 per share.

Common Stock

Voting Rights. Holders of common stock are entitled to one vote per share on all matters to be voted upon by the stockholders. The holders of common stock do not have cumulative voting rights in the election of directors.

Dividend Rights. Holders of common stock are entitled to receive ratably dividends if, as and when dividends are declared from time to time by our board of directors out of funds legally available for that purpose, after payment of dividends required to be paid on outstanding preferred stock, as described below, if any. Our senior credit facilities and indentures impose restrictions on our ability to declare dividends with respect to our common stock.

Liquidation Rights. Upon liquidation, dissolution or winding up, the holders of common stock are entitled to receive ratably the assets available for distribution to the stockholders after payment of liabilities and accrued but unpaid dividends and liquidation preferences on any outstanding preferred stock.

Other Matters. The common stock has no preemptive or conversion rights and, if fully paid, is not subject to further calls or assessment by us. There are no redemption or sinking fund provisions applicable to the common stock. All outstanding shares of our common stock are fully paid and non-assessable, and the shares of our common stock offered in this offering, upon payment and delivery in accordance with the underwriting agreement, will be fully paid and non-assessable.

Preferred Stock

Our amended and restated certificate of incorporation authorizes our board of directors to establish one or more series of preferred stock and to determine, with respect to any series of preferred stock, the terms and rights of that series, including:

- the designation of the series;
- the number of shares of the series;
- the preferences and relative, participating, option or other special rights, if any, and any qualifications, limitations or restrictions of such series; and
- the voting rights, if any, of the holders of the series.

Anti-Takeover Effects of Certain Provisions of Delaware Law and Our Amended and Restated Certificate of Incorporation and Bylaws

Certain provisions of our amended and restated certificate of incorporation and bylaws, which are summarized in the following paragraphs, may have an anti-takeover effect and may delay, defer or prevent a tender offer or takeover attempt that a stockholder might consider in its best interest, including those attempts that might result in a premium over the market price for the shares held by stockholders.

The Delaware General Corporation Law

Our company is a Delaware corporation subject to Section 203 of the Delaware General Corporation Law. Section 203 provides that, subject to exceptions specified in the law, a Delaware

4

corporation shall not engage in "business combinations" with any "interested stockholder" for a three-year period following the time that the stockholder became an interested stockholder unless:

- the corporation has elected in its certificate of incorporation not to be governed by Section 203, which we have not done;

- prior to that time, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding specified shares; or
- at or subsequent to that time, the business combination is approved by the board of directors of the corporation and by the affirmative vote of at least 66 2/3% of the outstanding voting stock which is not owned by the interested stockholder.

The three-year prohibition also does not apply to business combinations proposed by an interested stockholder following the announcement or notification of extraordinary transactions involving the corporation and a person who had not been an interested stockholder during the previous three years or who became an interested stockholder with the approval of a majority of the corporation's directors. The term "business combination" is defined generally to include mergers or consolidations between a Delaware corporation and an "interested stockholder," transactions with an "interested stockholder" involving the assets or stock of the corporation or its majority-owned subsidiaries and transactions which increase an interested stockholder's percentage ownership of stock.

The term "interested stockholder" is defined to include any person, other than the corporation and any direct or indirect majority-owned subsidiary of the corporation, that is the owner of 15% or more of the outstanding voting stock of the corporation, or is an affiliate or associate of the corporation and was the owner of 15% or more of the outstanding voting stock of the corporation, at any time within three years immediately prior to the relevant date, or the affiliates and associates of any such person.

Section 203 makes it more difficult for a person who would be an "interested stockholder" to effect various business combinations with a corporation for a three-year period. The provisions of Section 203 may encourage companies interested in acquiring our company to negotiate in advance with our board of directors, because the stockholder approval requirement would be avoided if our board of directors approves either the business combination or the transaction which results in the stockholder becoming an interested stockholder. These provisions also may have the effect of preventing changes in our board of directors and may make it more difficult to accomplish transactions which stockholders may otherwise deem to be in their best interests.

Classified Board

Our amended and restated certificate of incorporation provides that our board of directors will be divided into three classes of directors, with the classes to be as nearly equal in number as possible. As a result, approximately one-third of our board of directors will be elected each year. The classification of directors will have the effect of making it more difficult for stockholders to change the composition of our board. Our amended and restated certificate of incorporation and the bylaws provide that the number of directors will be fixed from time to time exclusively pursuant to a resolution adopted by the board, but must consist of not less than three or more than fifteen directors. Our board of directors is currently fixed at nine members.

Removal of Directors; Vacancies

Under the Delaware General Corporation Law ("DGCL"), unless otherwise provided in our amended and restated certificate of incorporation, directors serving on a classified board may be removed by the stockholders only for cause. Our amended and restated certificate of incorporation and bylaws provide that unless otherwise provided in our stockholders agreement, directors may be

removed only for cause and only upon the affirmative vote of holders of at least 80% of the voting power of all the then outstanding shares of stock entitled to vote generally in the election of directors, voting together as a single class. In addition, our amended and restated certificate of incorporation and bylaws also provide that unless otherwise provided in the stockholders agreement, any vacancies on our board of directors will be filled only by the affirmative vote of a majority of the remaining directors, although less than a quorum.

No Cumulative Voting

The DGCL provides that stockholders are not entitled to the right to cumulate votes in the election of directors unless our amended and restated certificate of incorporation provides otherwise. Our amended and restated certificate of incorporation does not expressly provide for cumulative voting.

No Stockholder Action by Written Consent; Calling of Special Meetings of Stockholders

Our amended and restated certificate of incorporation prohibits stockholder action by written consent. It also provides that special meetings of our stockholders may be called only by the chairman of our board, the chief executive officer or secretary at the direction of the board of directors.

Advance Notice Requirements for Stockholder Proposals and Director Nominations

Our bylaws provide that stockholders seeking to nominate candidates for election as directors or to bring business before an annual meeting of stockholders must provide timely notice of their proposal in writing to the corporate secretary.

Generally, to be timely, a stockholder's notice must be received at our principal executive offices not less than 90 days nor more than 120 days prior to the first anniversary date of the previous year's annual meeting. Our bylaws also specify requirements as to the form and content of a stockholder's notice. These provisions may impede stockholders' ability to bring matters before an annual meeting of stockholders or make nominations for directors at an annual meeting of stockholders.

Supermajority Provisions

The DGCL provides generally that the affirmative vote of a majority of the outstanding shares entitled to vote is required to amend a corporation's certificate of incorporation or bylaws, unless the certificate of incorporation requires a greater percentage. Our amended and restated certificate of incorporation provides that the following provisions in the amended and restated certificate of incorporation and bylaws may be amended only by a vote of at least 80% of the voting power of all of the outstanding shares of our stock entitled to vote:

- classified board (the election and term of our directors);
- the removal of directors;
- limited liability of directors;
- indemnification and advancement of expenses by us to our directors, officers, employees or agents;
- the prohibition on stockholder action by written consent;
- the ability to call a special meeting of stockholders being vested solely in our board of directors and the chairman of our board;
- the advance notice requirements for stockholder proposals and director nominations; and

- the amendment provision requiring that the above provisions be amended only with an 80% supermajority vote.

In addition, our amended and restated certificate of incorporation grants our board of directors the authority to amend and repeal our bylaws without a stockholder vote in any manner not inconsistent with the laws of the State of Delaware or our amended and restated certificate of incorporation.

6

Limitations on Liability and Indemnification of Officers and Directors

The DGCL authorizes corporations to limit or eliminate the personal liability of directors to corporations and their stockholders for monetary damages for breaches of directors' fiduciary duties. Our amended and restated certificate of incorporation includes a provision that eliminates the personal liability of directors for monetary damages for actions taken as a director, except for liability:

- for breach of duty of loyalty;
- for acts or omissions not in good faith or involving intentional misconduct or knowing violation of law;
- under Section 174 of the DGCL (unlawful dividends); or
- for transactions from which the director derived improper personal benefit.

Our amended and restated certificate of incorporation and bylaws provide that we must indemnify our directors and officers to the fullest extent authorized by the DGCL. We are also expressly authorized to advance certain expenses (including attorneys fees and disbursements and court costs) to our directors and officers and carry directors' and officers' insurance providing insurance for our directors, officers and certain employees for some liabilities. We believe that these indemnification provisions and insurance are useful to attract and retain qualified directors and executive officers.

The limitation of liability and indemnification provisions in our amended and restated certificate of incorporation and bylaws may discourage stockholders from bringing a lawsuit against directors for breach of their fiduciary duty. These provisions may also have the effect of reducing the likelihood of derivative litigation against directors and officers, even though such an action, if successful, might otherwise benefit us and our stockholders. In addition, your investment may be adversely affected to the extent we pay the costs of settlement and damage awards against directors and officers pursuant to these indemnification provisions.

There is currently no pending material litigation or proceeding involving any of our directors, officers or employees for which indemnification is sought.

Transfer Agent and Registrar

EquiServe Trust Company, N.A. is the transfer agent and registrar for our common stock.

Listing

Our common stock is listed on the New York Stock Exchange under the symbol "NLC."

Authorized but Unissued Capital Stock

The DGCL does not require stockholder approval for any issuance of authorized shares. However, the listing requirements of the New York Stock Exchange, which would apply so long as our common stock is listed on the New York Stock Exchange, require stockholder approval of certain issuances equal to or exceeding 20% of the then-outstanding voting power or then outstanding number of shares of common stock. These additional shares may be used for a variety of corporate purposes, including future public offerings, to raise additional capital or to facilitate acquisitions.

One of the effects of the existence of unissued and unreserved common stock may be to enable our board of directors to issue shares to persons friendly to current management, which issuance could render more difficult or discourage an attempt to obtain control of our company by means of a merger, tender offer, proxy contest or otherwise, and thereby protect the continuity of our management and possibly deprive the stockholders of opportunities to sell their shares of common stock at prices higher than prevailing market prices.

7

VALIDITY OF THE SHARES

The validity of the issuance of the shares of common stock will be passed upon for us by Simpson Thacher & Bartlett LLP, New York, New York. An investment vehicle comprised of selected partners of Simpson Thacher & Bartlett LLP, members of their families, related parties and others owns an interest representing less than 1% of the capital commitments of funds controlled by one of our large shareholders, The Blackstone Group.

EXPERTS

The consolidated financial statements of Nalco Holding Company at December 31, 2004 and December 31, 2003 and for the year ended December 31, 2004 and for the period from November 4, 2003 through December 31, 2003 (Successor) and the combined financial statements of Ondeo Nalco Group for the year ended December 31, 2002 and for the period from January 1, 2003 through November 3, 2003 (Predecessor), incorporated by reference in this prospectus and registration statement have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their reports thereon, and are incorporated by reference in reliance upon such reports given on the authority of such firm as experts in accounting and auditing.

AVAILABLE INFORMATION

We are required to file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy any documents filed by us at the SEC's public reference room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room. Our filings with the SEC are also available to the public through the SEC's Internet site at <http://www.sec.gov> and through the New York Stock Exchange, 20 Broad Street, New York, New York 10005, on which our common stock is listed.

We have filed with the SEC a registration statement on Form S-3 relating to the securities covered by this prospectus. This prospectus is a part of the registration statement and does not contain all the information in the registration statement. Whenever a reference is made in this prospectus to a contract or other document of the Company, the reference is only a summary and you should refer to the exhibits that are a part of the registration statement for a copy of the contract or other document. You may review a copy of the registration statement at the SEC's public reference room in Washington, D.C., as well as through the SEC's Internet site.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to "incorporate by reference" the information contained in documents that we file with them, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus and any prospectus supplement. Information in this prospectus supersedes information incorporated by reference that we filed with the SEC prior to the date of this prospectus, while information that we file later with the SEC will automatically update and supersede this information. We incorporate by reference the documents listed below and any future filings we will make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934.

- Our Annual Report on Form 10-K for the fiscal year ended December 31, 2004;
- Our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2005, June 30, 2005 and September 30, 2005;
- Our Current Reports on Form 8-K filed on January 11, 2005, February 22, 2005, March 1, 2005, May 5, 2005, May 10, 2005, May 11, 2005, May 27, 2005, June 10, 2005, June 30, 2005, August 12, 2005, August 23, 2005, September 1, 2005, September 21, 2005, September 22, 2005, September 27, 2005, October 4, 2005, October 27, 2005, November 15, 2005 and December 8, 2005; and
- All documents filed by us under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934 on or after the date of this prospectus and before the termination of this offering.

8

You can request a copy of these filings at no cost, by writing or calling us at the following address:

Nalco Holding Company
1601 West Diehl Road
Naperville, IL 60563
(630) 305-1000
Attention: Corporate Secretary

9

Nalco Holding Company

Common Stock
